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WATER PURIFICATION PLANT OF TOLEDO



MAIN BUILDING OF FILTRATION PLANT. VIEW OF FRONT

THE city of Toledo, Ohio, with a population of 200,000, which is rapidly increasing, secures its water supply from the lower Maumee River at a point $2\frac{1}{2}$ miles southwesterly from the postoffice, or about a mile from the southerly city line at Broadway.

From the lake to a point seven or eight miles above the present pumping station the Maumee River is really an arm of Lake Erie, the level of which fluctuates to an extent of nearly 25 feet. A drop in the level of eleven feet has been produced by a strong southwest wind and a rise of somewhat over 14 feet has been produced by ice gorges. Ordinarily the current in this part of the river is slight, but at times of extreme high water it becomes moderately strong.

Under ordinary conditions the water in this arm of the lake or river is moderately turbid except when it is disturbed by high wind or when the clearer water has been displaced by highly turbid water coming down from the rapids. Between Toledo and Grand Rapids there is a fall of 60 feet, which produces a very strong current except in the level reaches which occupy perhaps one-third of the distance. This current enables the water to pick up and carry a maximum amount of clay and other sediment, and this gives the water below the rapids a decidedly bad character. From a sanitary standpoint this water has been deteriorating rapidly on account of the ever-increasing population situated upon its banks and watershed. The water after leaving the rapids flows with a very slight current through this arm of the lake and deposits a considerable amount of sediment, thereby effecting a very material purification from both a physical and sanitary standpoint. Owing to its muddy condi-

tion the water is used for drinking purposes very sparingly. It varies in turbidity between the limits of 300 and 3,000 parts per 1,000,000.

The present pumping station is equipped with two 5,000,000-gallon Worthington compound, duplex horizontal pumping engines; one 7,000,000-gallon Knowles compound, duplex, horizontal pumping engine, and two vertical compound, duplex, high-duty Worthington pumping engines of 15,000,000 gallons capacity each, making a total pumping capacity of 47,000,000 gallons in 24 hours. The boiler plant consists of Sterling water-tube boilers of sufficient capacity to operate all the pumps; also a boiler of the Parker type of 800 hp, thus giving an increased boiler capacity as a reserve.

From a sanitary standpoint the turbidity and bacteria were elements to be removed, while for commercial purposes prevention of the scale formation caused by the presence of lime was necessary. The latter is a matter of extreme importance to manufacturing plants using water in their boilers, and in a city as large as Toledo the saving of soap is no small consideration.

Realizing the necessity for a better supply, the Board of Water Works Trustees in 1902 appointed Allen Hazen, of New York; G. H. Benzenberg, of Milwaukee, and William G. Clark, of Toledo, an engineering commission, to investigate and report on various proposed methods for securing an ample supply of clear, pure and wholesome water for domestic, manufacturing and municipal purposes and to recommend to them such supply as would be ample for forty years to come. In December of the same year the commission reported in favor

of a supply from the Maumee River, the source of the present supply, but at a point $2\frac{1}{2}$ miles up stream from the present intake. They further recommended that the supply be filtered by mechanical filters and delivered by conduit to the present pumping station.

In 1904 the Board of Public Service engaged Mr. Chas. L. Parmalee as engineer to take charge of the preparation of plans, specifications, etc., and to proceed with the construction of the plant as recommended by the commission. In the latter part of 1905 a contract was entered into with the S. M. Jones Company, of Toledo, to supply two units of a producer gas plant and two gas engines direct connected to two 15,000,000 gallon two-stage rotary pumps, together with the necessary auxiliaries. This plant was designed to take the water from a pump well and deliver it to the filter plant distant approximately 1,200 feet, pumping against a head of 65 feet. Another contract was entered into with the Norwood Engineering Company for the construction of the filter plant proper, including force mains from the pumps above referred to, the necessary buildings and a covered clear water reservoir of 5,000,000 gallons capacity. Shortly after these contracts were awarded all operations were stopped by litigation and nothing more was done until the spring of 1906, when the validity of the contracts was affirmed by the courts and the work was proceeded with. At this time Mr. W. G. Clark was placed in charge of the work as consulting engineer, which position he still occupies.

The average daily consumption of water in Toledo is now about thirteen million gallons, and it is estimated that in 1940 the daily consumption will be about 57 million gallons. Therefore, in the designs for the plant such portions as could not easily be enlarged were designed for an ultimate capacity of 60 million gallons. These include the pipe lines and conduits. The other portions of the plant were so arranged that the present capacity will be capable of later enlargement to the full capacity without any change in existing equipment. The present capacity of the filters is 20 millions; of the coagulating basins, 30 millions, and the low-service pumps 40 millions in two units. Room is left in the pump pit for four additional pumping units. Two additional coagulating basins, one on either side of the plant and each having a capacity of 15 million gallons per day, can be built beside the present basin. The filter house can be extended along its axis to make room for sixty instead of the present twenty filters. Another clear water basin can be built at the plant or, as is more probable, at the high-service pumping station in the city, or both.

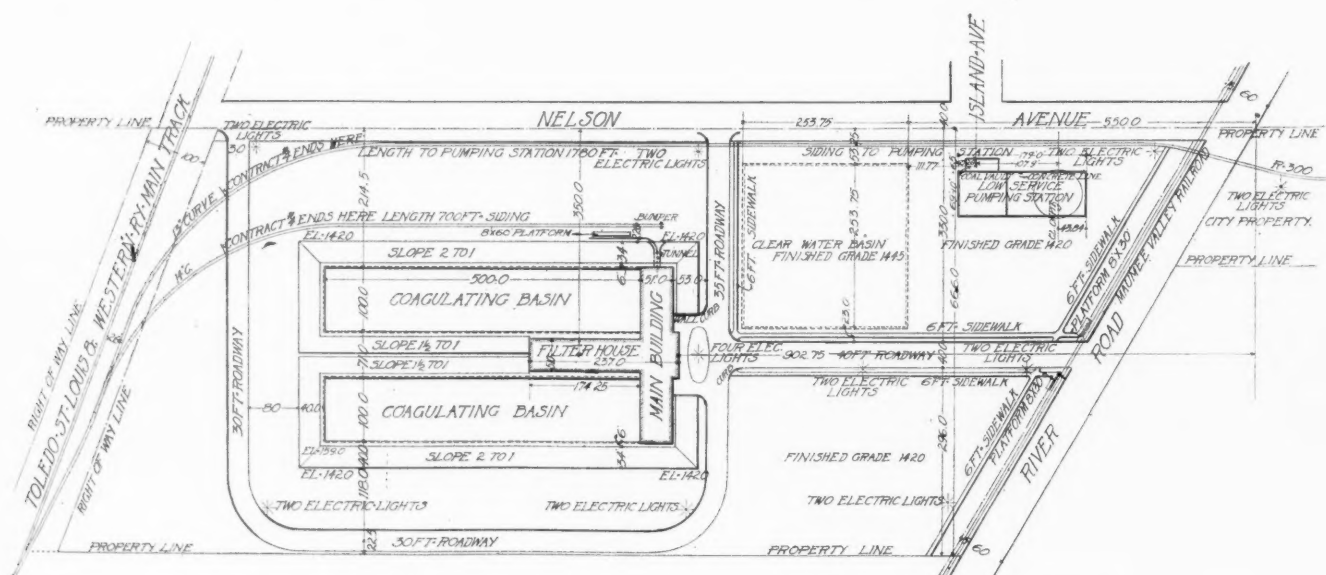
The intake crib will be built of wood and be of the submerged type, and is intended to be more or less temporary



FORM USED FOR CONDUIT. TOLEDO

and to be replaced at some future time by an intake pier. The 48-inch cast-iron intake pipe extends about 750 feet from the shore to the crib and is carried about 50 feet beyond, so that it can be connected with an intake pier without in any way interfering with the supply. This pipe connects the intake crib to a shore well, which is 10 feet inside diameter and is constructed of concrete extending to bed rock 25 feet below the river level. At an elevation of 18 feet above mean water level is the operating floor, above which is built a brick gate-house circular in plan. Extending at a level grade from the shore well to the suction well of the pumping station, a distance of 530 feet, is a 60-inch three-ring brick conduit. In this there will be placed a butterfly valve to control the flow of water in times of high stages of the river. This is to protect the pump pit, which is only 2 feet above the ordinary river level.

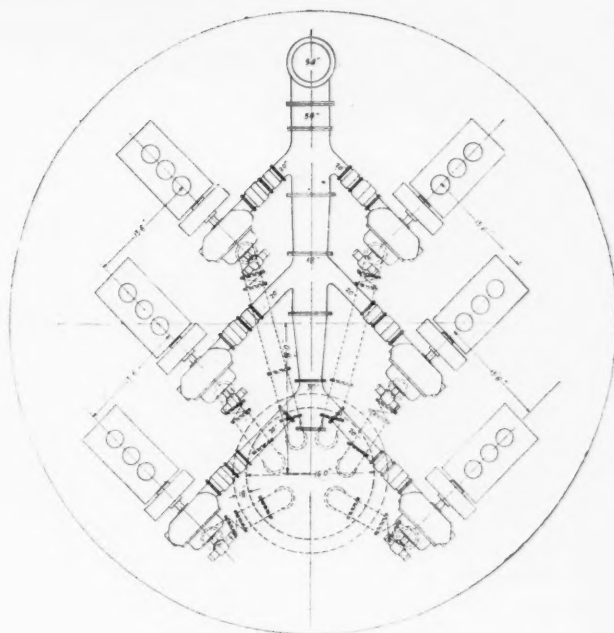
The pumping station is located well back from the river on the bluff. It was originally intended to locate this at the water's edge, but upon thorough investigation it was found that the difficulties of obtaining a satisfactory foundation and the danger from high water and ice gorges were such as to justify, if not actually require, the adoption of another location. It was, therefore, decided to build it at a point about 500 feet nearer the filter plant on the opposite side of the River road from the river. The building has a concrete foundation and a red-brick superstructure trimmed with stone. The roof is of red tile supported on steel trusses. The building is



GENERAL PLAN OF GROUNDS, SHOWING LOCATION OF NEW PUMPING AND FILTRATION PLANTS

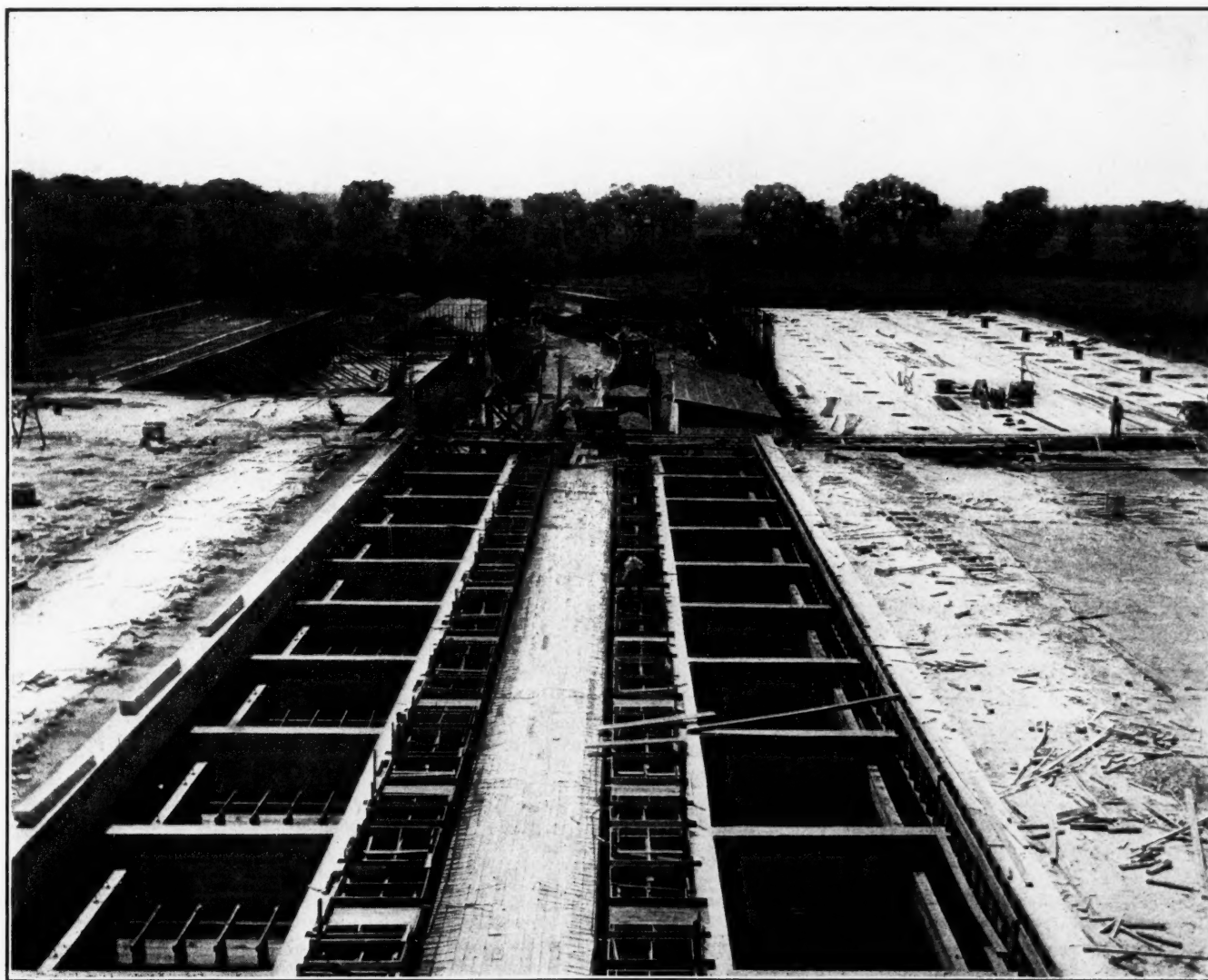
65 x 180 feet inside dimensions, the westerly 65 feet being occupied by gas producers and appurtenances, while the rest of the building will contain the pumping and electrical equipment. The floor of the easterly 115 feet, used as the machinery room, is 7 feet below the floor of the producer room, and is in part occupied by a circular pump pit 75 feet in diameter. The pump pit is 41 feet in depth below the main floor of the machinery room, and at the bottom of the pit will be located two direct connected gas engines and rotary pumps, space being provided for four additional units. The walls of the building are carried over the edges of this pit on concrete girders 7 feet high. In the construction of the pit a 7-foot annular trench was dug to the required depth. In this trench the concrete wall was built, after which the core of earth inside this was removed. The interior of the pit was given a finish by the use of surfacing boards.

One of the most interesting and novel features of the pumping plant will be the use of gas engines. This will be the largest installation ever used for the pumping of water. Two units of a six-unit suction gas-producer plant will be installed at the present time, together with the necessary purifying apparatus. These producers are being built by the R. D. Wood Company. Each unit will be capable of gasifying 300 to 400 pounds of bituminous coal per hour for a period of two to three hours, carrying a maximum load of 500 hp. during that time. One of the purifying appurtenances is a combination tar extractor and blower with which it is possible to produce a suction on the producers and a pressure on the engines. The arrangement is such that gas will be supplied as the engines require without the necessity of storage tanks. The pump pit



LOCATION OF PUMPS IN PUMP WELL

will ultimately contain six three-cylinder four-cycle gas engines, but at present only the two outer ones will be installed. Each unit will be of 100 kw. capacity. These are now being built by the Rathbun-Jones Engineering Company, of Toledo. These engines will be direct connected to two-stage enclosed



GENERAL VIEW OF FILTRATION PLANT, BEFORE ERECTION OF BUILDING
Filter beds in center, settling basins on either side

impeller centrifugal pumps and the specifications call for a combination capable of delivering 20 million gallons daily against a head of 70 feet.

Maximum utilization of the heat is contemplated with these engines by using the jacket water to heat the various buildings. The jacket water from the cylinders of each gas engine goes to a heater through which the exhaust from the engine is passed. This very effectively muffles the exhaust and furnishes water at a temperature of about 210 degrees Fahrenheit. This water passes through the system of pipes and radiators which heat the different buildings and returns in part to be again passed through the jackets of the cylinders, the heater, etc. This hot water will also be used in mixing the chemicals. The return water is at too high a temperature to permit of satisfactorily cooling the cylinders, and it will, therefore, be necessary to add to it, previous to its entering the jackets, such a percentage of cold water as will reduce it to the proper temperature. The surplus hot water not returned to the cylinder jackets is discharged into the influent well in the head house, the cold water supply being taken from the city mains. This scheme of heating the buildings will do away with a battery of two 80-hp. horizontal tubular boilers originally planned for this purpose, and will reduce the cost of operation by that much.

Gas engines will also be used to generate electricity for lighting the buildings and operating certain machinery.

The coal will be received at the low service pumping station on a siding elevated some 6 feet above the level of the ground. From the cars the coal will either be dumped or shoveled into a concrete underground coal bin having a capacity of about 250 tons. Underneath this bin is a low story which permits the coal to be drawn from the bin, crushed and delivered into cars by gravity or taken from the bins to the cars direct. An industrial track permits a car carrying a ton of coal to be taken to a platform elevator which elevates it to a level somewhat above the top of an overhead storage bin. This overhead bin has a capacity of approximately 70 tons of coal and feeds by gravity to the various producers.

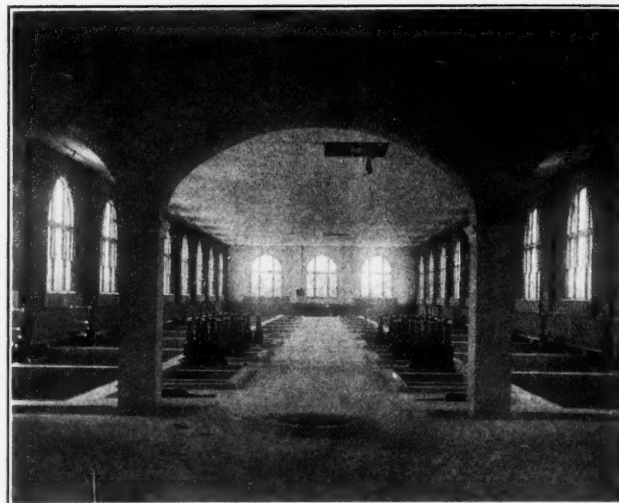
To assist in erection, repair and maintenance of the machinery in the machinery room, there has been provided an overhead traveling crane sweeping the entire room. It will have a capacity of 10 tons and will be hand operated.

The force mains leading from the pumping station to the filter plant proper are 42 inches in diameter and consist of riveted steel pipes made from plates $\frac{1}{4}$ -inch thick and protected by a coating of mineral rubber.

Located between the pumping station and the filter plant is a clear water reservoir, constructed of concrete and having a capacity of 5,000,000 gallons. The floor takes the form of inverted flat groined arches, supporting columns spaced 15-foot centers. The roof consists of groined arches having a rise of 3 feet. The reservoir, which is designed for the storage of filtered water, is 250 feet square and is connected with the conduit to the city. It has an effective depth below the springing line of the roof of about 12 feet. The roof is covered with an earthen embankment of sufficient depth to permit of sodding.

The filtration plant proper divides naturally into four parts—the head house, the filter house and two coagulating or sedimentation basins. The head house is of brick and concrete construction, 50 x 270 feet in plan, with the large dimension north and south. The east side of this building contains the main entrance, which is centrally located. The wide doors open upon an ample foyer with two flights of open concrete stairs decorated with iron railings. Public and private toilets, lavatories and shower baths all have a place in the building, the plumbing arrangements being of the most modern design.

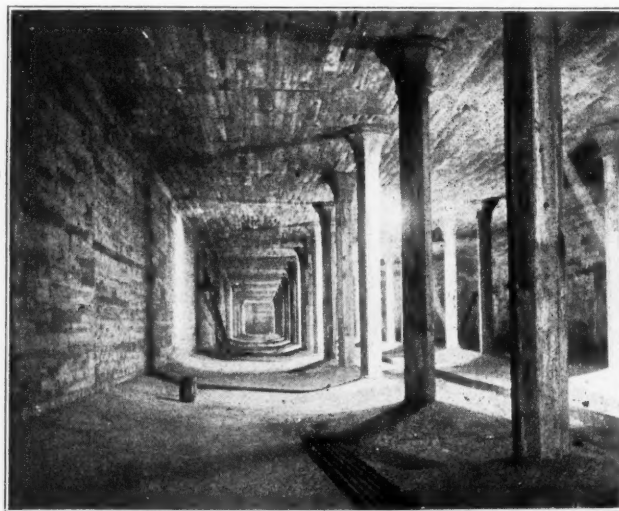
Extending westerly from the center of the head house is a space 70 feet in width in which are located the filters. At present twenty filters occupy this space for a distance of 170 feet, each designed to filter 1,000,000 gallons per day. It is expected to ultimately increase these to sixty. These filters are covered by a filter house 50 feet in width. The floor of



INTERIOR OF FILTER HOUSE
View from main building

the filter house is on a level with the tops of the filter tanks and also with the second floor in the head house. To the height of this second floor all the construction is of concrete or stone. Above the second floor, the walls are of red brick. The roofs are of red tile, carried on steel trusses, purlins and rafters.

Extending westerly at right angles from the north and south ends, respectively, of the head house and on either side of the filter house, are the two coagulating or sedimentation basins. These are each 100 feet in width (north and south), and 500 feet in length (east and west), and have an effective capacity of 5,000,000 gallons each. These basins are of concrete with concrete roofs, and each is divided longitudinally by a wall extending along its center line from the east end to within 50 feet of the west end. Here a weir is provided for the water to flow over and two vertical baffle walls, one in each section of the basin, force the surface water to the bottom. In this way a thorough mixing of the water is obtained, insuring uniform temperature and even action of the chemicals. The



INTERIOR OF COAGULANT OR SETTLING BASIN

treated water leaves the coagulating basins by flowing over skimmers and enters a duct through which it passes to the filters. The water remains in the coagulating basins about eight hours. The basins are banked and covered with earth to protect them from frost and make their operation more uniform.

The raw water comes from the pumping station in two 42-inch riveted steel pipes and is delivered to an influent well in the head house. Arrangements are made for introducing lime water at the bottom of this well and, if necessary, more lime can be added in the coagulating basin. Connections are also



FORMS AND REINFORCEMENT FOR ROOF OF COAGULANT BASIN

Showing Turner system of reinforcement

made so that sulphate of iron can be added in this well, but ordinarily it will not be added at this point. Running lengthwise of the head house are two concrete ducts, built side by side. One will carry the raw water to the coagulating basins while the other will carry the treated water from the basins to the filters. As the raw water enters the coagulating basin sulphate of iron is added and provision is also made for adding it at two points in the basins themselves.

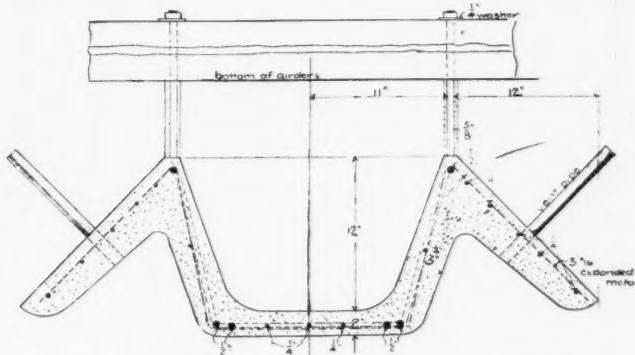
On leaving the influent well the water divides into two parts, one part going north and reaching the filters through the north coagulating basin, while the other traverses the south basin. The entrance to the north coagulating basin is located midway between the longitudinal division wall and the north wall at the east or head-house end, from which point the water flows west the entire length of the basin, returning through the south half. It is then led south through the concrete duct or channel, previously mentioned, to a central point in the east end of the filter house, where it is joined by the water which has traversed the south basin by a route which is symmetrical with that just described.

A broad operating floor extends down the middle of the filter house, with ten beds on each side. Immediately beneath the platform is the treated water conduit. Beneath this, at a sufficient distance to give space for a large open pipe gallery, is the clear water effluent conduit. The design of this part of the work is particularly admirable, as a large free space is left in the center of the pipe gallery, giving ready access to the piping on each side. Here are located the hydraulic valves and rate controllers.



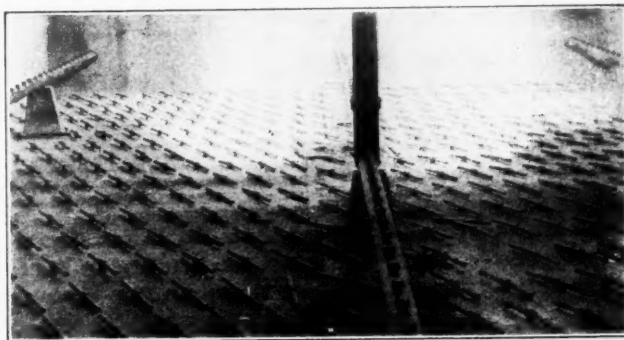
PIPE GALLERY. FLASHLIGHT VIEW

The filter beds are each 16 x 22½ feet in plan. The treated water enters each through a concrete distributing box, opening into two lateral troughs, which distribute it. The wash water is discharged through the same troughs and box. The troughs have the shape of an inverted W, the function of the outer



CROSS-SECTION OF WASH CHANNEL OR TROUGH

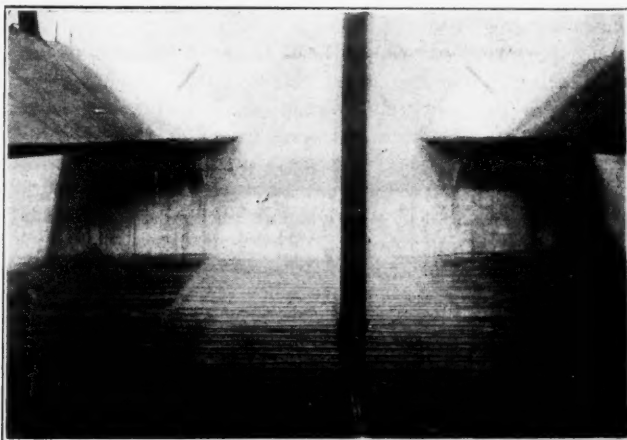
wings being to prevent wasting of sand by its being carried into the trough during washing. In the bottoms of the beds are cast-iron collectors and laterals with small risers cemented in the floor. Connected into the risers are brass T-shaped strain-



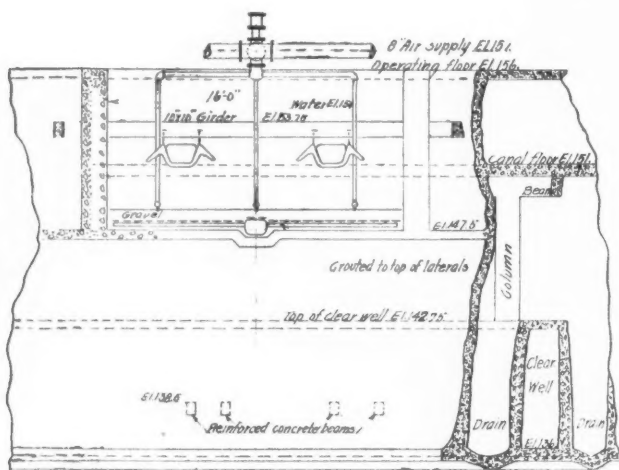
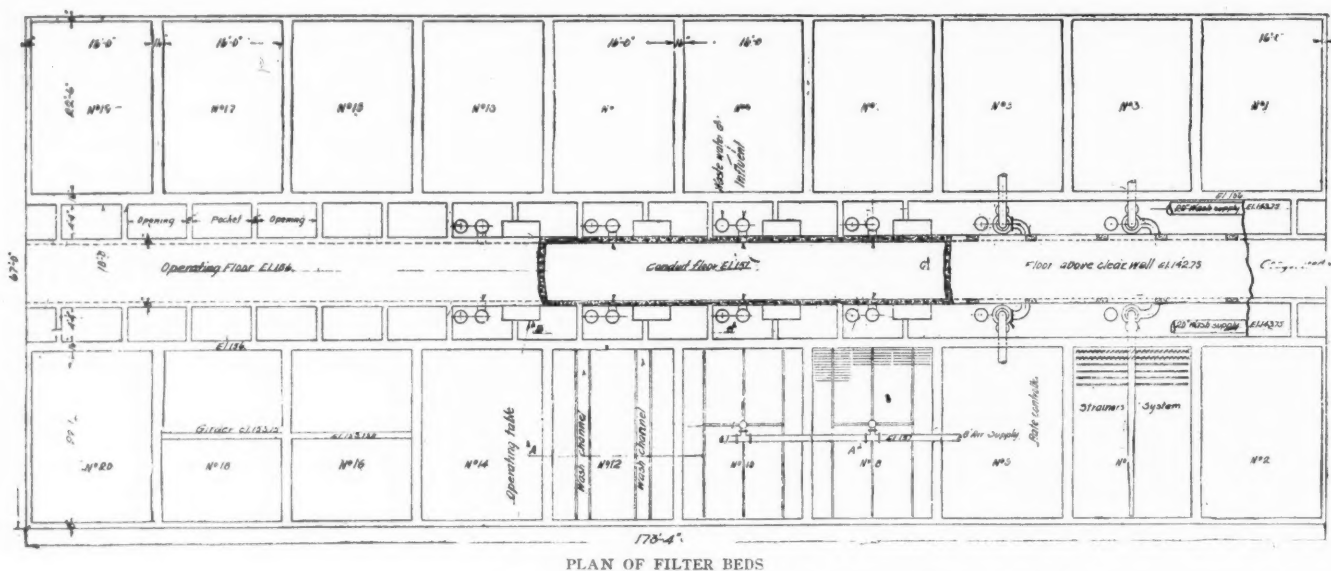
BOTTOM OF FILTER BED, SHOWING STRAINERS

ers. These are surrounded and covered with 9 inches of graded gravel. On top of the gravel is laid the air-washing system. This consists of three 2½-inch mains with numerous ¼-inch perforated laterals. On top of these and the gravel, and not separated from them by any screens, is 30 inches of sand. This sand is the finest of sea sand, brought from Cape May, on the Jersey coast, and has an effective size of 0.40 of a millimeter and a uniformity coefficient of 1.5.

The operating valves for each filter, instead of being placed on the table, are on separate pedestals. These include the usual six valves for influent, sewer discharge, air, effluent, drain and wash water. In addition to these a seventh allows the filling of the air line in each bed with water. This not only expels the air from the pipes and thus prevents its coming to the surface



AIR SYSTEM OF FILTER, RESTING ON GRAVEL



FILTER BED, SECTION THROUGH AA

later and making bore holes in the sand, but also has a tendency to prevent possible trouble from air leaks by the valve. As the air line for each bed is connected to a common supply pipe, the air valves are made double seated to prevent leaks. The beds will be washed with water flowing about 12 inches per minute and under a pressure of 5 to 7 pounds, and air under a pressure of 7 to 10 pounds.

On the operating tables will be placed the necessary gauges. There will be a recording gauge showing the suction on the effluent and the pressure on the wash water lines. Another recording gauge shows the pressure and suction on the air lines. A third recording gauge shows the opening of the ports in the rate controller valve. When the various port openings have been calibrated it will be possible to determine the amount of water passing onto the bed.

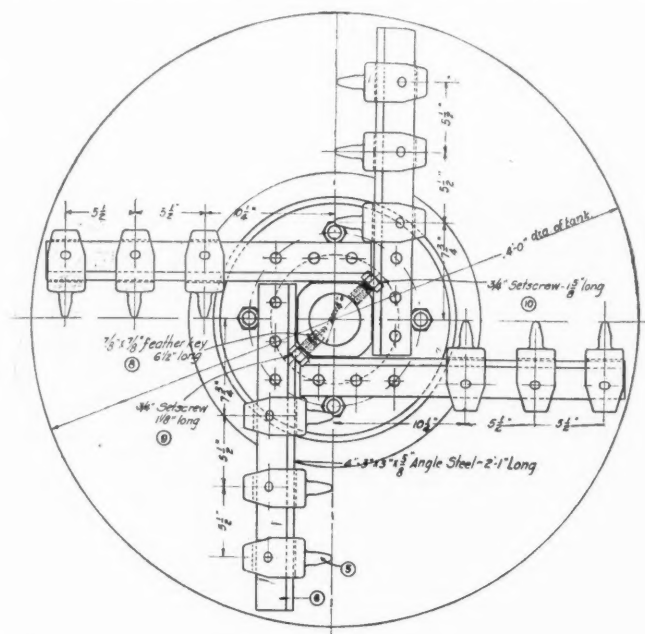
The northerly end of the head house is adjacent to a railroad siding. Running from this into the basement of the building is an industrial railroad which will carry chemicals and other supplies to the storage room at that end of the building. This railroad runs from the storage room, through a passage under the water ducts, to an elevator at the southerly end of the head house, where the chemicals can be elevated to the chemical mixing room.

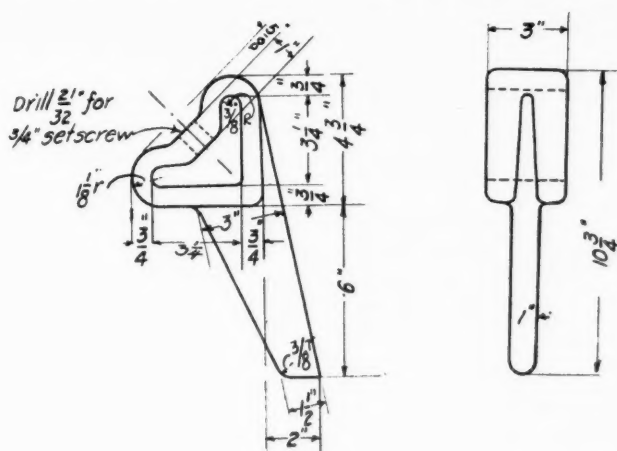
In this mixing room are four concrete tanks, each 16 x 32 feet, two being provided for lime water and two for the solution of sulphate of iron. Each of these tanks is provided with mechanical agitators driven by electric motors from above. Above each of the large tanks are smaller steel slacking tanks, which also are provided with mechanical agitators, and hot water will be used both for slacking the lime and for dissolving the sulphate of iron. The latter solution will flow directly from the dissolving tank to the big mixing and storage tanks, where

additional water will be added. The lime will be slacked to milk of lime in the lime-slacking tanks, and will flow from there to another steel tank, where clear water, the amount controlled by an automatic regulator, will be added before it is discharged to the large mixing and storage tanks. Connected to the lime-slacking tanks are blowers, which will take the dust from the upper part of the tank and force it into the water beneath, thus doing away with the nuisance caused by its escape into the air.

Both the iron and lime solutions will be maintained at constant strength. The amounts introduced into the raw water will be controlled by hand-operated valves, the quantity depending on the character and amount of water supplied. The iron solution will be maintained at a constant head by means of weir boxes supplied by pumps, the excess being returned by overflow pipes to the suction. An adjustable orifice will regulate the amount supplied.

In the head house, just south of the main entrance and at the ground level, is the machinery room. Here are located two centrifugal wash-water pumps direct connected to Westinghouse 50-hp., d.c. motors. The wash water will be taken from the effluent conduit. There are also two Root positive air blowers driven by motors of the same size and design as the pump motors. These blowers, which have a capacity of 1,500 cu. ft. of free air per minute against five pounds pressure, are

LIME-DISSOLVING TANK
Top view of twelve stirrer teeth



STIRRER TEETH. SIDE AND END VIEWS.

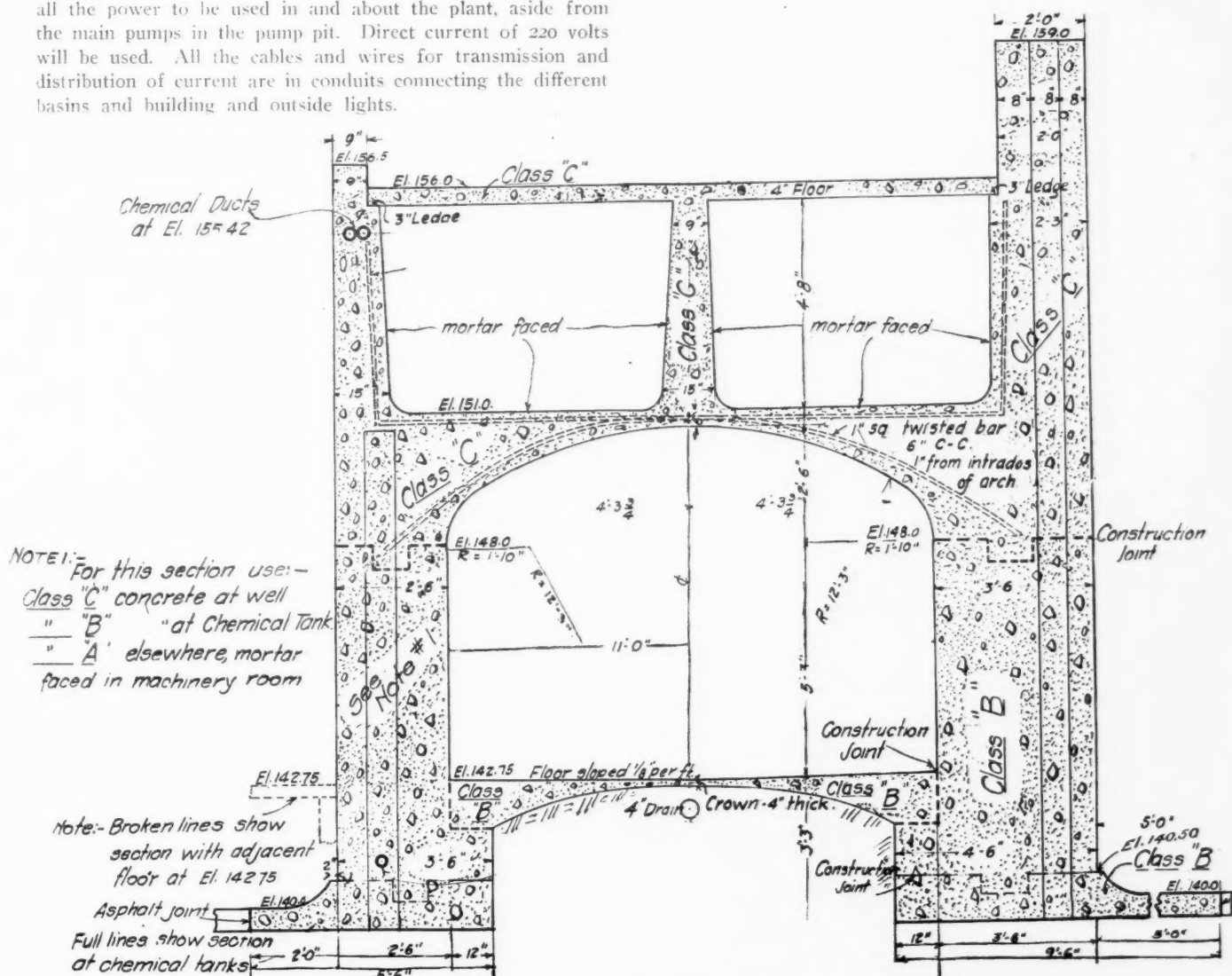
connected to a 12-inch main air line which branches to two 10-inch lines, one on either side of the filter house. Smaller motor-driven pumps are also located here for handling the chemical solutions and taking samples of water. The control of all the pumps is by means of a Cutler-Hammer switch-board located on the main floor at the level of the filter room. As far as possible motors have been duplicated both as regards speed and horsepower, so as to minimize the number of reserve parts necessary and to permit substitution in case of accident. All machinery is electrically driven. All the pumps are rotary pumps. The generators in the pumping station are expected to furnish current for lighting the grounds, buildings, coagulating basins and the clear water reservoir and to furnish all the power to be used in and about the plant, aside from the main pumps in the pump pit. Direct current of 220 volts will be used. All the cables and wires for transmission and distribution of current are in conduits connecting the different basins and building and outside lights.

Completely equipped chemical and bacteriological laboratories are located just north of the main entrance at the level of the filter room.

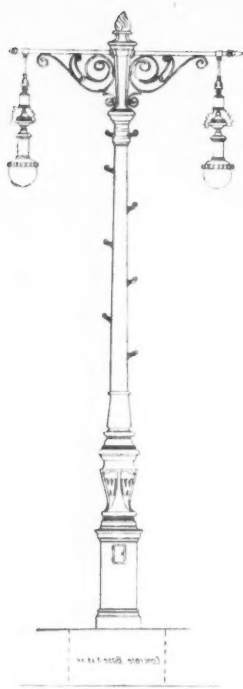
The superintendent will have his office near the main entrance on the operating floor. From this position he can see the entire operation of the plant and exercise control of every department. Wall gauges will show him the conditions of the various parts of the water supply. Small sample pumps are connected directly with the chemical room. The disposal of the wash water from the filters through pipes leading into the sewer is a feature worth mentioning, as is also the temporary wall at the rear of the filter house, which permits of an easy extension of the plant at any time, it being possible to add to the capacity 10,000,000 gallons without changing the settling basins.

The filtered water leaves the building by the duct already mentioned, which connects to a 6-foot conduit leading along the River Road to the present high-service pumping station. A 30-inch pipe connects this conduit to the clear-water basin previously mentioned, which acts as an equalizer. The conduit is about $2\frac{1}{2}$ miles long. For the greater part of the distance it is built of concrete and was constructed in tunnels running through a clay soil. One section under a small stream was built of 5-foot riveted steel pipe. The walls of the concrete part are 10 inches thick, the inner 2 inches being made of a 1 to 2 plaster. Great care was exercised in making the concrete. The sand and gravel were graded so that the voids were reduced to about 16 per cent., and the cement only slightly exceeded this amount. The design is such that the external pressure will in all cases be greater than the internal.

The pumps at the high service pumping station now take their suction from wells connected by a tunnel and submerged



TYPICAL SECTION ACROSS CONDUITS THROUGH CENTER OF MAIN BUILDING



ARC-LIGHT STANDARD USED
AT PURIFICATION PLANT

intake pipe with an inlet crib. The water in the suction wells stands substantially at river level. In order to connect the filtered water supply with these pumps and to permit the use at pleasure of either the present supply or the filtered water supply, connections are being made to the suction of the pumps by introducing a valve in each of the suctions, and a tee between it and the pump. To this tee will be connected the filtered water supply, which is controlled by a valve located near the tee. These valves are gate valves, double disc and piston, operated hydraulically and tested at 300 pounds pressure.

When the filter plant is in operation the water will be delivered to the pumps at the high service pumping station at an elevation varying from 30 to 46 feet above the river level. This will reduce the coal consumption and in part compensate for the high head pumped against at the low service pumping station. The Norwood Engineering Company of Florence, Mass., are the contractors for the filtration plant, including the clear water basin. The concrete and general building construction under this contract, amounting to somewhat more than one-half of the total, was sub-let to the A. Bentley & Sons Company, of Toledo. The last-named were also contractors for the low service pumping station. The intake pipe was laid by James Rooney, contractor. Two sections of the concrete conduit were constructed by Watters & Tansey, of Toledo, Ohio. The third section of the concrete conduit was constructed by McKinney Bros., of Toledo, Ohio, and the iron pipe section of the conduit is being constructed by M. Rabbitt & Sons, of Toledo, Ohio.

We are indebted for much of our information to the Public Service Commission of Toledo, to Mr. Wm. G. Clark, consulting and supervising engineer on the work, and to Mr. H. McKecknie, resident engineer at the filtration plant.

SAN FRANCISCO'S ASPHALT PLANT

THIS municipal plant during July made and laid over 54,000 cubic feet of mixture. The details of the quantities and costs are summarized as follows:

| WORK AT PLANT | | Cubic feet Mixture | Cost of Material Incorporated | |
|--|------------|---------------------------------|-------------------------------------|------------------------------|
| Wearing surface | | 26,096 | \$7,349.44 | |
| Blinder | | 28,088 | 3,847.29 | |
| Cost of labor at plant | | | 2,288.86 | |
| Cost of power, oil, fuel, etc..... | | | 775.31 | |
| Total cost of material to the street..... | | 54,184 | \$14,260.90 | |
| WORK ON STREET | | Square Feet Laid | Cost per Square Foot | |
| Roving | \$4,833.45 | 144,111 | 0.0334 | |
| Palace Hotel vicinity | 1,276.07 | 31,610 | 0.04 | |
| Bush street | 527.24 | 16,163 | 0.0326 | |
| Totals | | \$6,636.76 | 191,884 | |
| Total cost of material to the street..... | | | \$14,260.90 | |
| Total square feet laid..... | | | 191,884 | |
| Cost of material per square foot..... | | | \$0.0743 | |
| | | Cost of Labor Per Sq. Ft. | Cost of Material Per Sq. Ft. | Total Cost Per Sq. Ft. |
| Roving | | 0.0334 | 0.0743 | 0.1077 |
| Palace Hotel | | 0.04 | 0.0743 | 0.1145 |
| Bush street | | 0.0326 | 0.0743 | 0.1069 |
| Mean average of work on all classes, 0.1089. | | | | |

By "roving" is meant work done in various scattered locations. The work at Palace Hotel included extra quantities of rock and binder to regrade the foundation; approximate cost, 1 cent per square foot. The cost of sand, asphalt and other materials was greater than previously, increasing the cost of paving proportionately. The cost of hauling to scattered roving jobs adds considerably to the cost of that work.

CHICAGO'S CITY PLAN

General Description Given by Mayor Busse—Lake Front, Highways, Railway Terminals, Parks and Civic Centers—Large Area Included

ON July 6, Mayor Fred A. Busse, of Chicago, in a message to Council, called attention to the Chicago plan for the development and the improvement of the city, requesting the Council to authorize him to appoint a commission to contain members drawn both from the Council and from the citizens at large "whose duty it shall be to take up this question to the end that the whole city and all elements in it may be fully informed as to what is contemplated in this plan for the future, so that an official plan of Chicago may be produced that will have the endorsement and support of the entire municipality." The mayor was on the same day authorized to appoint such a commission.

In this communication the mayor gave a general description of the plan. The central idea is that the development and improvement of the city should be guided along certain definite and prearranged lines, to the end that the necessary expenditures for public improvements which are made from year to year may be of permanent value and may become points of a well-constructed, consistent, practical, organized scheme of municipal development. The plan is presented not as being in its final form but rather as being a basis and starting point from which to work in the development of an official municipal plan. The idea is not to provide for the expenditure of enormous sums within the next four or five years, but rather to provide a plan for spending money during the next fifty or one hundred years, most of which would be spent anyhow from time to time in similar public improvements. This plan fits in with the recommendations of the harbor commission; it takes into account and provides for the city's growing transportation needs in relation both to steam roads and to transportation within the city limits and communication between the different divisions of the city.

"This plan is not to be considered as the embodiment of an artist's dream or the project of theoretical city beautifiers who have lost sight of everyday affairs and who have forgotten the needs of the mass of the people. On the contrary, the men who have produced the Chicago plan are all hard-headed business men whose interests, individually and collectively, are bound up absolutely with the industrial and commercial growth of the city. They have had in mind at every step not only the artistic but also the commercial and industrial development of the city of Chicago along lines that promise the best results at the least expenditure of time, effort and money."

There are six main divisions of the plan: 1. Improvement of the lake front. 2. Creation of a system of highways outside the city. 3. Improvement of railway terminals and the development of a complete traction system for both freight and passenger service. 4. Acquisition of an outer park system and of parkway circuits. 5. Systematic arrangement of streets and avenues within the city in order to facilitate movement to and from the business district. 6. Development of centers of intellectual life and of civic administration, so related as to give coherence and unity to the city.

The plan covers an area included within a radius of 60 miles from the heart of Chicago as a center. In this are located railway stations, electric light and power stations, as well as radiating and encircling highways; also a street plan carried out somewhat in detail. It is planned to locate at Grant Park, on the lake front, in addition to the existing Art Institute and the Field Museum and Crerar library, other buildings pertaining to arts, literature and science, making this an intellectual center. A civic center containing city, county and federal buildings is located at Halsted and Congress streets.

Those directly responsible for this plan, being employed by the Commercial Club of the city for preparing it, were Daniel H. Burnham, and Edw. H. Bennett, architects.

ASPHALT AND WOOD BLOCK COMPARED

Information from Fourteen European and Fourteen American Cities—Qualities in Which Wood Block and Those in Which Asphalt Paving Excel

In 1908 Col. H. N. Ruttan, City Engineer, of Winnipeg, Man., collected information concerning the relative efficiency and satisfactoriness of asphalt and wood-block pavements in various cities of both Europe and America, and the replies were tabulated in his annual report for that year, which tables are presented herewith. The questions submitted included the average life, cost of maintenance, ease of cleaning, smoothness to traction, sanitation, noise and foothold offered. There is seen to be a very great lack of uniformity in the opinions contributed concerning most of these points. In Europe wood is uniformly reported as being the most expensive in maintenance, while in this country wood is said to compare favorably with asphalt in maintenance cost in six cities out of seven. In the matter of cleaning, asphalt is placed first in all European cities and in five out of eleven of the American cities, three of the other six American cities reporting no difference between the two in

this respect. In ease of traction, asphalt is reported as leading in five European cities, three report no difference, and the others do not report upon this point; while in American cities asphalt is reported best in one city, wood in three cities and in six there is said to be no difference. In the matter of sanitation, asphalt is reported as being best in all the European cities and in five of the American cities, while in two American cities wood is reported as best, and in four the two are said to be equal. In the matter of noise, wood is reported as being best in seven European cities, two others reporting wood and asphalt as being equal in this respect; while in American cities wood is reported best in all but one case, in which the two are said to be equal. As to foothold offered, wood is placed ahead by all the European cities, but in the American cities wood is considered best in only three cases and asphalt best in six cases, two considering that there is no difference between them. Summarizing the replies the majority of American cities seem to consider that wood leads in noiselessness, ease of traction and cost of maintenance, and that asphalt leads in ease of cleaning, sanitation and foothold offered. In the matter of average life there appears to be little uniformity or consistency in the replies. But, in general, the life of asphalt appears to be considered greater than that of wood block.

WOOD BLOCK AND ASPHALT PAVEMENTS

TABULATION OF REPLIES FROM EUROPEAN CITIES REGARDING ASPHALT AND WOOD BLOCK PAVEMENTS

| NAME OF CITY | Have you had opportunity of comparing asphalt and wood pavement under heavy traffic. | Kind of Wood and Treatment | Average Life of Wood | Average Life of Asphalt | Cost of Maintenance | Ease of Traffic | Cleaning | Sanitation | Noise | Foothold |
|--------------------|--|--|------------------------|-------------------------|-------------------------|-------------------|-----------|------------|----------------|----------|
| Berlin..... | Yes..... | Australian hard wood.. Creosoted soft wood. | ..... | About 19 years | W. more expensive | ..... | ..... | ..... | ..... | ..... |
| Birmingham..... | No..... | Hard wood..... | 10-11 years. | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Brussels..... | Yes..... | Creosoted blocks..... | 9-10 years. | 14-15 years. | ..... | A. best.. | A. best.. | A. best.. | W. best.. | W. best. |
| Buda Pesth..... | Yes..... | Creosoted soft wood.. | 3 years..... | 14 years..... | W. more expensive | Same... A. best.. | A. best.. | A. best.. | W. best.. | W. best. |
| Frankfurt A.M..... | Yes..... | Creosoted soft wood.. | 10 years..... | 18 years..... | { Wood 50 A. 25-40. | A. best.. | A. best.. | A. best.. | W. best.. | W. best. |
| Glasgow..... | Yes..... | Australian hard wood.. | 7 years..... | 10 years..... | W. more expensive | A. best.. | A. best.. | A. best.. | W. best.. | A. best. |
| Leipzig..... | Yes..... | Creosoted soft wood.. | 10-12 years. | 10 years..... | A. more expensive | Same... Same.. | A. best.. | A. best.. | W. best.. | W. best. |
| Liverpool..... | Medium traffic.. | Australian hard wood.. | 15 years..... | 15 years..... | W. more expensive | A. best.. | A. best.. | A. best.. | W. best.. | W. best. |
| Lyons..... | Medium and light traffic. | Resinated creosote soft wood. | Med. traffic 12 years. | Heavy traffic 8 years. | No record..... | Same... A. best.. | A. best.. | A. best.. | Same... Same.. | W. best. |
| Manchester..... | No..... | Australian hard wood.. | 12-15 years. | ..... | { Wood 50 Asphalt 40 | ..... | A. best.. | A. best.. | W. best.. | W. best. |
| Munich..... | Yes..... | Creosoted soft wood.. | 8 years..... | 15 years..... | ..... | ..... | A. best.. | A. best.. | W. best.. | W. best. |
| Newcastle..... | No..... | Australian hard wood.. | Over 12 years | ..... | ..... | A. best.. | A. best.. | A. best.. | Same... Same.. | W. best. |
| Nottingham..... | No..... | Creosoted soft wood.. | Heavy traffic 8 years. | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Stockholm..... | No..... | Creosoted soft wood.. | Med. traffic 10 years. | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

REMARKS.

Berlin—While wood so far is considered satisfactory, it has not been in use long enough to express decided opinions as to its comparative merits.
 Brussels—Asphalt pavement cost about 30c. per square yard per annum.
 Buda Pesth—Try to avoid use of wood blocks wherever possible.
 Frankfurt—Wood paving only used when gradient is over 1.60.
 Manchester—Wood pavement employed only at churches. Team owners object to it on account of its slipperiness.

TABULATION OF REPLIES FROM AMERICAN CITIES REGARDING ASPHALT AND WOOD BLOCK PAVEMENTS

| NAME OF CITY | Have you had opportunity to compare asphalt and wood under heavy traffic. | Properties of Blocks | Average Life of Wood | Average Life of Asphalt | Comparison Cost of Maintenance | Ease of Cleaning | Ease of Traffic | Sanitation | Noise | Foothold |
|--------------------|---|--|------------------------------------|-------------------------|--------------------------------|------------------|-----------------|------------|-----------|------------------------------------|
| Baltimore..... | Yes..... | 16 to 20 lb. per c. f. | 5-10 years. | ..... | ..... | ..... | ..... | ..... | ..... | Wood very slippery in wet weather. |
| Buffalo..... | Yes..... | Unprepared..... | ..... | 10-14 years. | ..... | A. best.. | Equal.. | A. best.. | W. best.. | Equal. |
| Chicago..... | Yes..... | 16 per c. f. | ..... | ..... | ..... | A. best.. | Equal.. | A. best.. | W. best.. | W. best. |
| Galveston..... | No..... | 12 lb. | Blocks unsatisfactory. | ..... | ..... | A. best.. | A. best.. | A. best.. | W. best.. | W. best. |
| Grand Rapids..... | Yes..... | Creosoted..... | ..... | 12-15 years. | W. best.. | Equal.. | Equal.. | Equal.. | W. best.. | A. best. |
| Indianapolis..... | Yes..... | 5-6 lb. | ..... | 15-16 years. | W. best.. | W. best.. | Equal.. | Equal.. | Equal.. | A. best. |
| Kansas City..... | Yes..... | 16 lb. | ..... | ..... | A. best.. | ..... | ..... | ..... | ..... | A. best. |
| Minneapolis..... | Yes..... | 12 lb. | 10 years. | Less than 10. | W. best.. | W. best.. | W. best.. | W. best.. | W. best.. | W. best. |
| New York..... | Yes..... | 20 lb. creosote and resin. | ..... | ..... | ..... | Equal.. | Equal.. | Equal.. | W. best.. | W. best. |
| San Francisco..... | Yes..... | No type of wood block has proven satisfactory. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | A. best wet. |
| South Bend..... | Yes..... | Creosoted..... | Over 10 years | 15 years. | W. best.. | Equal.. | W. best.. | Equal.. | W. best.. | Equal. |
| Springfield..... | Yes..... | 21-22 lb. creosote and resin. | ..... | ..... | W. best.. | W. best.. | W. best.. | W. best.. | W. best.. | A. best. |
| Toledo..... | Yes..... | 16 lb. | Over 7 years. | ..... | W. best.. | A. best.. | ..... | A. best.. | W. best.. | A. best. |
| St. Louis..... | Yes..... | 20 lb. | Wood is considered very expensive. | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Toronto..... | Yes..... | Creosote and carbolite. | 6-10 years. | 12 years. | ..... | A. best.. | Equal.. | A. best.. | W. best.. | ..... |

COST OF LAYING WATER PIPES

Cost by Day Labor in Boston for the Past Thirty Years—Cost in Seven Other Massachusetts Cities—Analyses and Comparisons of Figures Reduced to a Common Basis

THE recently published Volume III of the Report of the Finance Commission of the city of Boston, Mass., which is devoted solely to the reports made to the Commission at various times by Metcalf & Eddy, of Boston, contains some valuable data regarding the cost of laying main water pipes in Boston and the efficiency of the day labor forces employed for the purpose. The more important facts and their applications are presented in the following abstract.

The specific results of the investigations are summarized in the accompanying table. That these costs are excessive is self-evident, but interest centers in the careful analysis made by Metcalf & Eddy with regard to the efficiency of the labor employed. The average cost of pipelaying was reduced to a uniform basis, first to \$2 per day and sixty hours per week, and second a further reduction to the basis of a uniform average length of job each year equal to 500 feet.

Diagram No. 1 shows the general relation of the cost per foot to the length of the job for five of the years under consideration, viz.: 1886, 1891, 1896, 1902 and 1906. It will seem that the form of curve is substantially similar in all cases. From these curves was computed the increase in labor cost per foot for shorter jobs as compared with the cost for 1,000 feet, in percentages, and the results shown by the dotted curve on the same diagram. This curve shows that the increased cost per foot of a piece of work 100 feet long over what it would have been if 1,000 feet long is 90 per cent. The increased cost for a 200-job is 55 per cent.; for 300 feet, 34 per cent.; for 400 feet, 21½ per cent.; for 500 feet, 13 per cent.; and for 600 feet, 8 per cent.

From the same line of reasoning it is readily apparent that in years when the average length of job is high, the corresponding

cost per foot should be less than when the average length is low. From their study of the relations of average length to average total cost per foot, partly by mathematical work and partly by the exercise of judgment, the engineers deduced factors by which the costs can be reduced to an average annual length of job of 500 feet; the labor cost so reduced is given in the last column of the table. In other words, this column is intended to show costs which should be absolutely comparable in all particulars, having been reduced not only to a uniform basis of wages and hours of labor, but also to a uniform basis of average length of job.

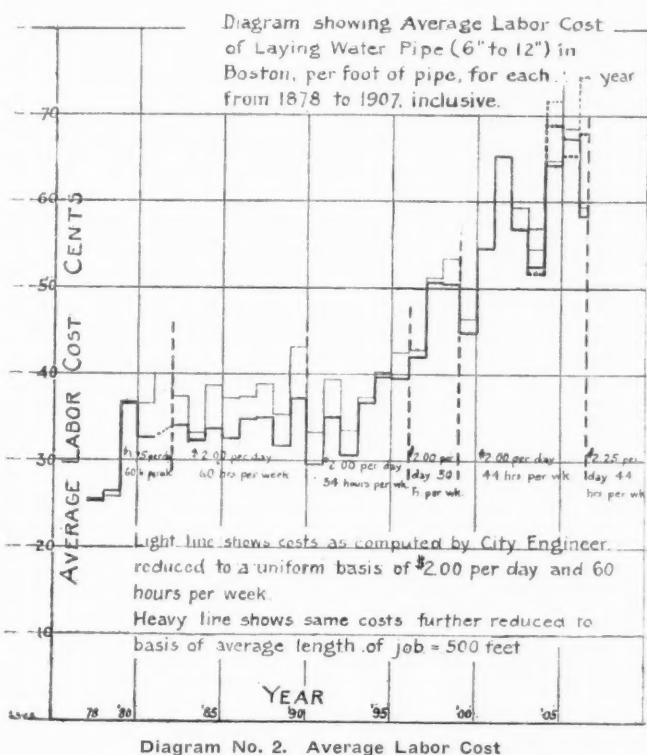
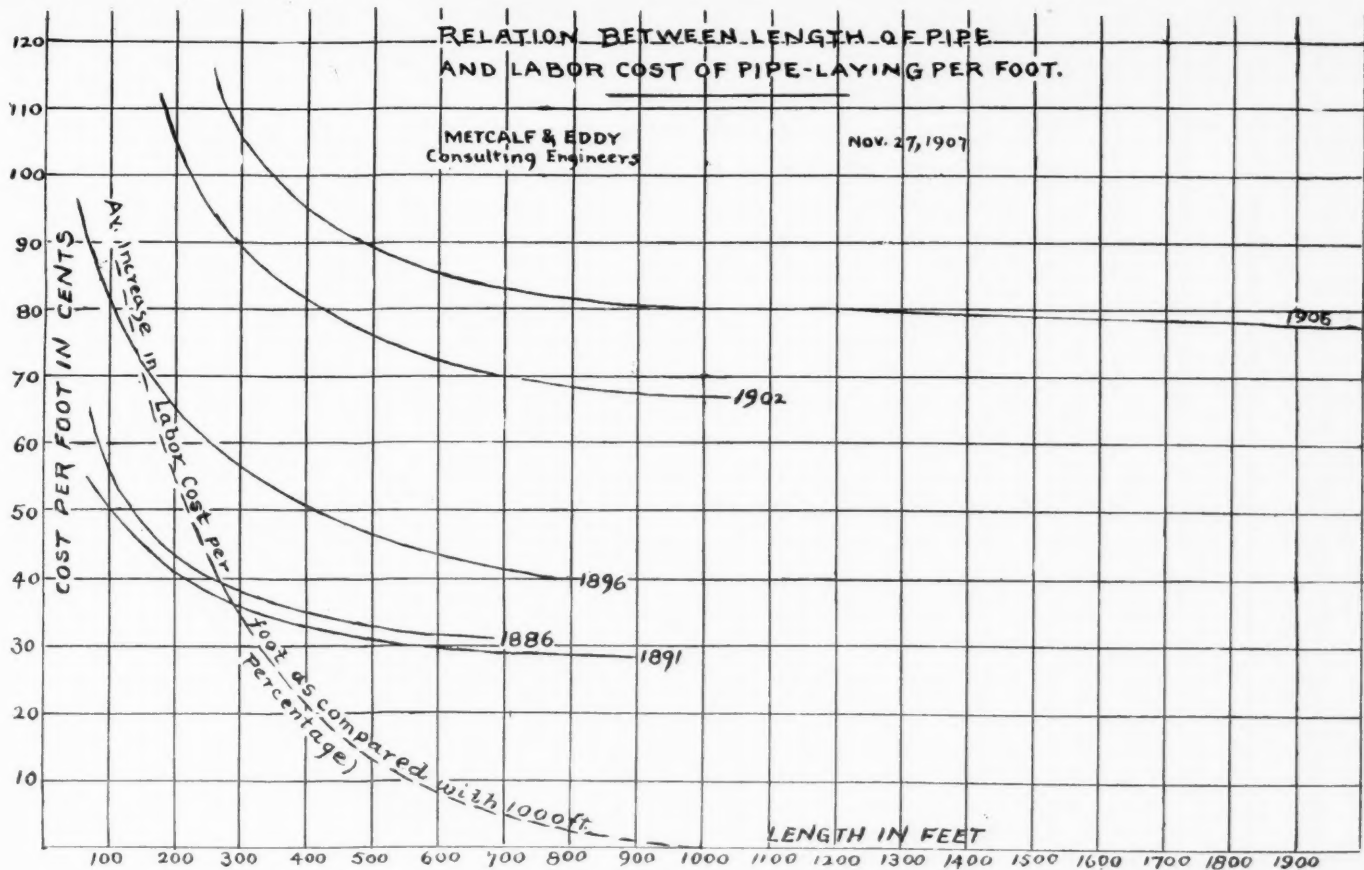
The results are indicated somewhat more clearly by Diagram No. 2, showing by the light line the average labor cost as computed by the City Engineer for uniform conditions of wages and hours of labor, and by the heavy line the further reduction for a uniform length of job. This latter line shows, under the assumed basis, the average labor cost of about 33 cents per foot to and including 1893, and a rapidly increasing cost up to 1906. On this diagram, as on the large ones prepared by the City Engineer, the dotted lines show the effect of omitting the work done by contract in 1904, 1905, 1906 and 1907, which had been included by the City Engineer. On this basis it is seen that the cost in 1906 and 1907 was somewhat less than in 1905, although greater than in any preceding year.

Further comment upon these diagrams is perhaps superfluous. Metcalf & Eddy emphasize the statement that the increased labor cost can be charged to nothing but inefficiency of labor.

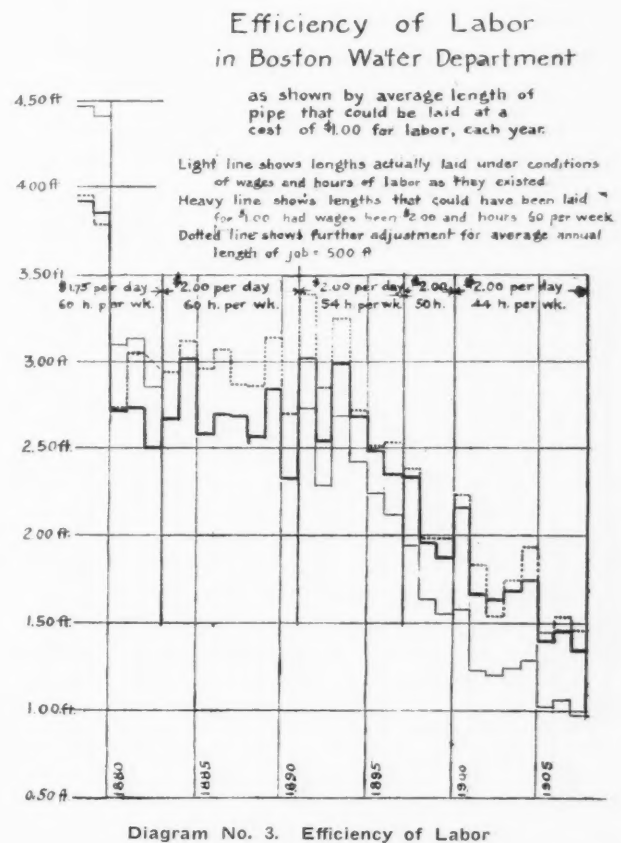
In order to show somewhat more clearly the change in efficiency of labor, two other diagrams, Nos. 3 and 4, were prepared; these show directly the efficiency of labor instead of the

TABLE SHOWING THE AVERAGE LABOR COST PER LINEAR FOOT OF LAYING WATER PIPE IN BOSTON EACH YEAR FROM 1878 TO JUNE, 1907, INCLUSIVE

| YEAR | Wages Per Day | Number of Jobs | Total Length of Pipe (Feet) | Average Length of Job (Feet) | Hours Per Week | LABOR COST PER FOOT IN CENTS | | | Average Cost Reduced to Uniform Basis of Av. Per Day 60 Hours Per Week | Average Cost Further Reduced to Uniform Average Length of Job (500 Ft.) |
|------|---------------|----------------|-----------------------------|------------------------------|----------------|------------------------------|-------|---------------------|--|---|
| | | | | | | Max'm | Min'm | Average Actual Cost | | |
| 1878 | \$1.75 | 9 | 4,398 | 489 | 60 | 35.4 | 17.2 | 22.3 | 25.5 cents | 25.3 cents |
| 1879 | 1.75 | 4 | 3,110 | 778 | 60 | 29.5 | 17.4 | 22.7 | 25.9 " | 26.4 " |
| 1880 | 1.75 | 9 | 4,258 | 473 | 60 | 74.9 | 25.0 | 32.3 | 36.9 " | 36.6 " |
| 1881 | 1.75 | 2 | 557 | 279 | 60 | 33.6 | 29.4 | 32.0 | 36.6 " | 32.7 " |
| 1882 | 1.75 | .. | ..... | ..... | 60 | ..... | ..... | 35.0? | 40.0? " | ..... |
| 1883 | 2.00 | 15 | 4,787 | 319 | 60 | 49.6 | 27.4 | 37.3 | 37.3 " | 34.0 " |
| 1884 | 2.00 | 20 | 8,710 | 435 | 60 | 75.0 | 22.6 | 33.1 | 33.1 " | 32.1 " |
| 1885 | 2.00 | 14 | 3,065 | 219 | 60 | 79.1 | 21.4 | 38.8 | 58.8 " | 33.7 " |
| 1886 | 2.00 | 29 | 7,056 | 243 | 60 | 141.6 | 21.0 | 37.1 | 37.1 " | 32.5 " |
| 1887 | 2.00 | 38 | 13,943 | 367 | 60 | 104.2 | 21.9 | 37.2 | 37.2 " | 34.8 " |
| 1888 | 2.00 | 38 | 11,203 | 295 | 60 | 119.7 | 19.5 | 38.9 | 38.9 " | 35.0 " |
| 1889 | 2.00 | 48 | 14,215 | 296 | 60 | 105.94 | 13.63 | 35.26 | 35.26 " | 31.8 " |
| 1890 | 2.00 | 30 | 6,306 | 210 | 60 | 105.0 | 15.52 | 43.05 | 43.05 " | 37.1 " |
| 1891 | 2.00 | 74 | 20,428 | 276 | 54 | 94.83 | 16.32 | 36.82 | 33.1 " | 29.6 " |
| 1892 | 2.00 | 59 | 16,527 | 280 | 54 | 242.4 | 24.0 | 43.7 | 39.3 " | 35.0 " |
| 1893 | 2.00 | 23 | 7,593 | 330 | 54 | 63.6 | 20.4 | 37.2 | 33.5 " | 30.7 " |
| 1894 | 2.00 | 45 | 19,037 | 423 | 54 | 215.3 | 11.5 | 41.3 | 37.2 " | 36.8 " |
| 1895 | 2.00 | 36 | 17,353 | 482 | 54 | 88.8 | 18.8 | 44.6 | 40.1 " | 30.8 " |
| 1896 | 2.00 | 39 | 13,975 | 358 | 54 | 282.6 | 16.7 | 47.3 | 42.6 " | 39.6 " |
| 1897 | 2.00 | 21 | 9,613 | 458 | 50 | 112.5 | 21.1 | 51.5 | 42.9 " | 42.0 " |
| 1898 | 2.00 | 22 | 10,628 | 483 | 50 | 95.8 | 36.4 | 61.3 | 51.1 " | 50.6 " |
| 1899 | 2.00 | 31 | 11,685 | 377 | 50 | 149.3 | 32.9 | 64.1 | 53.4 " | 50.4 " |
| 1900 | 2.00 | 19 | 8,502 | 447 | 44 | 99.6 | 28.2 | 63.1 | 46.3 " | 44.9 " |
| 1901 | 2.00 | 11 | 3,478 | 316 | 44 | 130.5 | 47.2 | 81.8 | 60.0 " | 54.6 " |
| 1902 | 2.00 | 14 | 8,789 | 628 | 44 | 185.6 | 60.1 | 83.4 | 61.2 " | 65.1 " |
| 1903 | 2.00 | 9 | 3,765 | 418 | 44 | 121.6 | 43.4 | 80.7 | 59.2 " | 56.9 " |
| 1904 | 2.00 | 9 | 3,704 | 411 | 44 | 93.0 | 55.6 | 74.5 | 54.6 " | 52.5 " |
| 1905 | 2.00 | 12 | 5,745 | 479 | 44 | 148.2 | 51.7 | 88.5 | 64.9 " | 64.2 " |
| 1906 | 2.00 | 22 | 15,178 | 690 | 44 | 139.1 | 57.1 | 83.3 | 61.1 " | 67.2 " |
| 1907 | 2.00 | 13 | 5,979 | 460 | 44 | 130.6 | 66.8 | 81.0 | 59.4 " | 58.2 " |



cost of pipelaying. This efficiency is shown in the first of these diagrams by the number of feet of pipe which could be laid at an average cost of \$1 for labor. Three lines are given upon this diagram: the first, showing the average number of feet actually laid each year from 1878 to 1907, at a labor cost of \$1, under existing conditions of wages and hours of labor; the second, showing the number of feet that could have been laid for \$1 had wages and hours of labor been uniform at \$2 per day and sixty hours per week; and, third, a further reduction showing the number of feet that could have been laid at a labor cost of



\$1 if wages and hours had been uniform as before, and if the annual average length of job had been 500 feet in all cases. This diagram shows that, with wages and hours as they actually existed, in 1878, nearly $4\frac{1}{2}$ feet of pipe were laid for a dollar; from 1880 to 1890, about 2.7 feet; in 1896, about 2 feet; in 1900, about 1.6 feet, and in 1907, less than 1 foot was laid for a labor

Efficiency of Labor in Boston Water Department

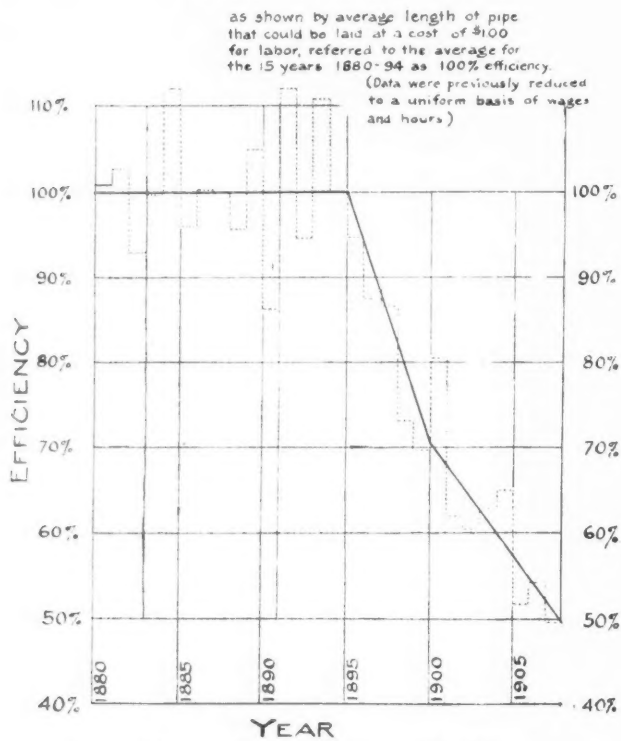


Diagram No. 4. Efficiency of Labor

cost of \$1. Had the wages and hours been uniform at \$2 and sixty hours, these figures would have been:

| | |
|--------------|----------------|
| 1878..... | about 4½ feet. |
| 1880-90..... | " 2.7 " |
| 1896..... | " 2 1/3 " |
| 1900..... | " 1.9 " |
| 1907..... | " 1 1/3 " |

On Diagram 4, to show more clearly the real trend of the changes in efficiency and to eliminate the effect of the annual fluctuations, a heavy line has been drawn to show the average condition, while light dotted lines show the efficiency for individual years. In this diagram efficiency is shown by reference to the average for the fifteen years, 1880 to 1894, inclusive, when, as is shown by the diagram, the fluctuations were not unusual, and were about equally distributed upon both sides of the average line; or, in other words, the efficiency during the period from 1894 to 1907 is compared with the average efficiency between the year 1880 and the year 1894. Taking the average number of feet of pipe laid for \$1 during this period as 100 per cent efficiency, the corresponding efficiencies for the other years are easily obtained. It appears from this diagram that at the end of 1899 the efficiency of labor had fallen to about 79 per cent of what it was during the 15-year period from 1880 to 1894, and at the middle of 1907 (that is, the end of the present diagram) the efficiency was a trifle less than 50 per cent of what it had been during the 15-year period.

This inefficiency is due to various causes. The engineers elsewhere reported in some detail showing the effect of age upon efficiency. Other causes which doubtless have greater or less effect are lack of discipline, political appointments, and more or less inefficient organization.

After considering the first years shown on the diagram, which show a reasonably uniform average labor cost of about 33 cents per foot up to and including 1893 under the assumed uniform conditions (equivalent to 45 cents per foot when the wages are \$2 and the hours forty-four per week, or 50.6 cents per foot for \$2.25 and forty-four hours), it is not necessary to compare the present cost with costs in other cities to see that it is excessive.

The engineers have, however, collected considerable comparative information regarding the cost of pipe-laying in various cities in New England. These costs were all on the day-labor basis by municipal forces. The difference in dimensions of the trenches and in wages and hours of labor made comparison somewhat difficult, but they succeeded in reducing the data to practically a uniform basis and in adjusting the rates at different periods so as to conform to the period covered by the cost determinations in Boston. This includes 2½ years, namely, 1905 to July 1, 1907.

In the accompanying table are given, following the name of each city, the wages and hours of common labor during the period under discussion; the length of pipe included in making up the average cost; the years in which this pipe was laid; the actual labor cost per foot; the depth of trench; the corresponding cost per foot for a trench 6 feet deep, such as is used in the city of Boston, and, finally, the corresponding cost for a 6-foot trench, if the wages had been uniformly \$2 per day and the hours 60 per week.

In making the computations, it was assumed that a trench 6 feet deep would cost 20 per cent more per foot than one 5 feet deep. As a matter of fact, the actual increase in cost would probably be something less than 20 per cent, since there would be very little if any increased cost of placing the pipe, making joints, etc., and no increase in the cost of teaming. On the other hand, the cost of excavation for the lowest foot might be a little greater than one-fifth of the average cost, but in most cases probably not enough greater to offset the practically unchanged cost of the items mentioned above. The addition of 20 per cent is, therefore, probably more than ample to allow for the increased depth of trench.

In reducing the actual costs to what they would have been had the wages been \$2 per day and the hours 60 per week, it has been assumed that the actual efficiency of labor per hour was unaffected by the change in hours and wages.

The figures in the last column of the table should be absolutely comparable. The greater difficulties encountered in Boston on account of many obstructions, etc, do not enter, since all jobs involving such difficulties have been rigidly excluded from the computations and comparisons.

From them it is evident that the pipe-laying cost in the city of Boston is 69 per cent greater than that of the average of the other seven cities, and nearly 44 per cent greater than the cost in Worcester, where it is the highest of any of the seven.

In the case of Cambridge, besides data showing the cost in

TABLE SHOWING COMPARATIVE LABOR COST OF LAYING PIPE IN VARIOUS CITIES

| CITY | ACTUAL AVERAGE WAGES AND HOURS OF COMMON LABOR | | Length of Pipe Included in Computing Average Cost Ft. | Year | Actual Cost of Labor per Ft. of Pipe—Cents | Depth of Trench Ft. | Computed Cost of Labor per Ft. of Pipe for 6-Ft. Trench Cents | Corresponding Cost of Labor per Ft. of Pipe with Wages \$2 and Hours 60 per week Trench 6 Ft. Deep |
|-----------------------------------|--|-------|---|----------------------|--|---------------------|---|--|
| | Wages | Hours | | | | | | |
| Boston..... | \$2.00 | 44 | 12,151 | 1905-6-7 (To July 1) | 96.1 | 6 | 96.1 | Cents 70.5 |
| Worcester* | 2.00 | 48 | 5,551 | 1907 | 50.9 | 5 | 61.1 | 48.9 |
| Cambridge..... | 2.00 | 47 | ..... | 1905 | 50.25 | 5 | 60.3 | 47.3 |
| Lowell..... | 2.00 | 48 | 5,915 | 1907 | 49.1 | 5 | 58.9 | 47.1 |
| Somerville..... | 2.00 | 47 | 2,418 | 1906 | 45.2 | 5 | 54.2 | 42.5 |
| Newton..... | 1.75 | 48 | 2,238 | 1906-7 | 53.0 | 6 | 53.0 | 42.4 |
| New Bedford..... | 2.00 | 48 | 15,720 | 1907 | 34.7 | 5 | 41.6 | 33.3 |
| Chelsea..... | 2.00 | 46 | 2,474 | 1906 | 32.7 | 5 | 37.3 | 30.1 |
| Average of all except Boston..... | 2.00 | ..... | ..... | ..... | ..... | ..... | ..... | 41.7 |

* It should be noted that a portion of the work done in Worcester in 1907 showed extremely high costs and the average cost is therefore high. Had the year 1906 been taken the average cost in last column would have been 34.7c.

1905, average labor cost per foot was furnished for laying 4, 6, 8 and 12-inch pipe from 1894 to 1903. The fluctuations in these costs are not remarkable and there was no wide divergence from the average during this period of ten years. After adding 20 per cent to make the figures comparable with those for 6-foot trench in Boston, the average for the ten years was 40.4 cents per foot for all sizes, or, separating the figures, 31.4 cents for 4-inch pipe, 35.1 cents for 6-inch, 43.4 cents for 8-inch and 51.6 cents for 12-inch. In 1905, however, as already noted, the average cost on the comparative basis was 60.3 cents per foot, an increase of 49 per cent over the average for the ten years 1894-1903. No data were furnished which explained this sudden increase.

Reducing 40.4 cents per foot to the \$2-per-day and 60-hour-per-week basis, the comparative labor cost of pipe-laying in Cambridge prior to 1904 was found to be 31.6 cents per foot. During this same period, 1894-1903, the labor cost in Boston reduced to the same basis was rapidly increasing and ranged from 37.3 cents at the beginning of the period to 59.3 cents at the end, or from 18 per cent to 88 per cent more than the cost in Cambridge.

Metcalf & Eddy show that from the foregoing information it can only be concluded that under labor conditions as they exist in other neighboring cities, a fair average labor cost for pipe-laying work, reduced to the uniform basis of \$2 per day and 60 hours per week, would be about 42 cents per foot, with 50 cents as a maximum. Of course, individual pieces of work would often exceed the average and others would frequently fall considerably below it.

ANTI-GRAFTING DISCUSSION.

August 24, 1909.

Editor Municipal Journal and Engineer,
231 West 39th Street, City.

Dear Sir: I have read with much interest your editorial on "The Formation of an Anti-Grafting Association." I thoroughly agree with you that "the time is ripe for some action which will immediately decrease, if not entirely remove, the graft which is now so common a feature of municipal contracts." I do not think, however, that your editorial has touched the root of the evil. You propose a cure for the evil after it has had a footing. I would suggest creating conditions which would remove the temptation from contractors and city officials to resort to graft.

It is my opinion that the vast majority of Councilmanic bodies are honest. How many are naturally honest, and how many are honest through fear of exposure, it is not our province to discuss at this time. I believe, moreover, that very few contractors desire to make an illegitimate profit out of public works by corrupting the city officials or the engineer. Contractors do, however, desire to make a fair profit; that is precisely what they are in business for, but, to talk to many engineers, one would think otherwise. It is true, also, that most specifications and contracts are drawn to defeat, purposely or otherwise, this legitimate desire on the part of the contractor. Knowing that their estimates are oftentimes based upon insufficient data, engineers are the more zealous to hedge the contractor about with unfair restrictions. Contractors, on the other hand, are guided very largely by these same insufficient estimates of the engineers. They reason that the engineer has spent more time investigating the conditions than they are possibly able to do; that the engineer has had months to secure his data and prepare his plans; while the contractor is usually given less than a week.

In the vast majority of cases we find that the specification and contract, as drawn by the engineer, places the entire responsibility for all unforeseen conditions upon the contractor's shoulders. The specifications have the contractor so firmly bound that, as a matter of self-protection, he is compelled to look for loopholes.

It is beside the question to say that contractors do not have to bid upon such specifications. So common are such specifications that contractors might as well go out of business as to refuse to bid upon them. Neither can they bid for such work what they believe the work will fairly cost them should the engineer insist upon an exact compliance with every provision of the specifications and contract, for in nine cases out of ten such a bid would be far above the appropriation, and the work would thus go by default. The city is in the end then a sufferer in not securing fair bids, and the doors for graft are thrown open and the temptation laid bare.

I strongly advocate that engineers write specifications so that they can honestly and honorably, under the terms of the specifications, pay the contractor for the reasonable cost of the work as it develops, and not as the engineer hoped it might develop. In such an event the contractor would not have to seek favors from Councilmen; he would look to the engineer for fair and square treatment. The city would then be paying only for what it honestly gets, and not, as often now, for graft that goes into private pockets and not into the work done for the city.

It is argued that this method gives cause for suspicion that the engineer is prompted by improper motives when he gives the contractor more than his clients had been told the work should cost. There is no judge upon the bench that is not open to the same suspicion when he gives a judgment in favor of either party; yet we do not think of curtailing a judge's authority or power for fear of his giving a dishonest judgment. Furthermore, engineers are dealing with physical facts that can generally be tested out. Fair payment for actual work will remove the temptation to resort to bribery from ninety-nine contractors out of a hundred, and the engineer or city official who then takes graft can soon be spotted.

How many railroad engineers do we find accused of dishonest

practices? How many railroad contractors are accused of grafting? Not many. The reason is that in the great bulk of railroad work, which is let to contractors under more favorable conditions than municipal work usually is, if the contractor meets with unfavorable conditions, some way is found to adjust the matter. We very rarely hear of a railroad contractor going "broke."

Until municipal engineers can trust themselves to write a contract which will enable them to meet the conditions exactly as they are found upon the work, or until they are able to appreciate the exact worth of the restrictions which they put upon the contractor in their specifications, and estimate the work accordingly, just so long will we find dishonest practices, and all the anti-graft societies in the country will not stamp out graft. In my opinion there is not much to choose between a dishonestly honest engineer and a dishonest engineer. Remove the incentive for the offering of graft and we will soon remove the blot on our great American escutcheon.

Yours very truly,
ALEXANDER POTTER.

PRODUCER-GAS PUMPING PLANT

IN 1908 the Water Commissioners of West Springfield, Mass., decided to increase their pumping and filter capacity, and decided to use either fuel or oil or producer gas for the pumping engines. Bids were received naming a guaranteed duty in foot-pounds per gallon of oil or per 100 pounds of coal when raising water at the rate of $1\frac{1}{4}$ million gallons in 24 hours, this to include fuel used in banking the gas producer when pumping only 16 hours out of the 24. Four bids were received for each kind of apparatus, the duty guaranteed for the oil engines varying from 10 million to 12 million foot-pounds per gallon of oil, and that for the producer-gas engines varying from 115 to 120 million foot-pounds per 100 pounds of pea anthracite. The plant selected was a producer manufactured by the Smith Gas Power Company, of Lexington, Ohio, rated at 75 hp; a two-cylinder horizontal-opposed Olin gas engine, and a Rumsey triplex pump, this being the plant which had guaranteed 115 million foot-pounds duty on the basis of the coal containing 12,500 B.T.U. per pound. The producer was 60 inches in diameter and 10 feet high. The gas engine was 12 inches by 20 inches, and the pump 13 inches by 14 inches single-acting, triplex. This plant was offered by the Walsh Boiler & Iron Works, of Springfield, for \$7,900. It was tested on March 20 of this year in a 16-hour run, of which the following gives the details:

TEST OF WEST SPRINGFIELD GAS PUMPING PLANT.

Duration of Run.

Engine started, 4:16 p. m.; pump started, 4:20 p. m.; pump stopped, 8:30 a. m.; length of run 16 hr. 10 min.

Capacity.

| | |
|---|------------|
| Displacement (theoretical) of pump per revolution, gal. | 24.132 |
| Revolutions of pump for two hours (5:30 to 7:30) during test for capacity | 4,098 |
| Normal discharge in 2 hours (5:30 to 7:30), gal. | 98,675.75 |
| Actual discharge as measured in reservoir, gal. | 95,199.46 |
| Percentage of slip | 3.52 |
| Actual discharge in gal. per revolution | 23.282 |
| Total revolutions during test | 32,953 |
| Total gal. pumped with allowance for slip | 767,211.75 |
| Average r.p.m. | 33.96 |
| Average gal. pumped per minute | 790.9 |
| Rate of pumping per 24 hours | 1,139,310 |

Pressures.

| | |
|---|--------|
| Average pressure on force main gauge in pounds | 98.97 |
| Average pressure on force main gauge in feet | 228.04 |
| Average suction lift in inches of vacuum | 8.74 |
| Average suction lift in feet | 9.88 |
| Difference between elevation of pressure and vacuum gauges, ft. | 2.125 |
| Total average lift during test, ft. | 240.04 |

Fuel Consumption.

| | |
|---|----------|
| Total coal fired during run of pump, lb. | 1,315.5 |
| Total coal consumed in banking period, lb. | 125.25 |
| Total coal used in 24 hours, lb. | 1,440.75 |
| Ashes from producer during run of pump, lb. | 281.00 |
| Ashes from producer during period of banking, lb. | 20.00 |
| Total ashes in 24 hours | 301.00 |

Analysis of Coal.

| | | |
|------------------------|-----------------|------------------|
| Moisture | 3.78 per cent. | Analysis of Ash. |
| Volatiles | 5.68 per cent. | 5.97 per cent. |
| Fixed carbon | 59.61 per cent. | 46 per cent. |
| Ash | 30.02 per cent. | 10.14 per cent. |
| Sulphur | .91 per cent. | 83.34 per cent. |
| | | .09 per cent. |

100.00 per cent.

| | | |
|---|------------------|----------|
| B.t.u. per lb. coal | 100.00 per cent. | 9,965 |
| Weight of coal fired during run, with deduction of 3.78 per cent. for moisture, lb. | | 1,265.78 |
| Weight of coal consumed in banking, with correction for moisture, lb. | | 120.52 |
| Total weight of coal fired during test, lb. | | 1,386.30 |
| Basis of efficiency guarantee on coal of 12,500 b.t.u. | | |
| Ratio of heat value of coal used to basis of guarantee, per cent. | | 79.7 |
| Equivalent weight of coal of quality of guarantee (12,500) necessary in test, lb. | | 1,104.87 |

| | |
|--|-------------|
| <i>Duty.</i> | |
| Average duty per 100 lb. of coal, corrected for moisture, fired during run, ft.-lb..... | 121,340,000 |
| Average duty per 100 lb. of coal, corrected for moisture, fired during test (including banking), ft.-lb..... | 110,800,000 |
| Average duty per 100 lb. of coal of heat value equivalent to basis of efficiency guarantee, ft.-lb..... | 139,010,000 |

The total average lift during the test was 240.04 feet, but the plant may be called upon to operate against a maximum head of about 241 feet. An analysis of the coal which was used in the test showed that it contained large quantities of slate and developed but 80 per cent of the 12,500 B.T.U. upon which the guarantee was based. It was necessary to allow for this in calculating the duty obtained, which allowance increased this from 110,800,000 to 139,010,000, the latter being considerably in excess not only of the guarantee of this company, but even of the highest guarantee offered by any other bidder.

GARDEN CITIES IN ENGLAND

A GARDEN city scheme is being carried out at Letchworth, garden villages at Earswick, Port Sunlight, Ealing, Coryndon and Knebworth, and garden suburbs at Bournville, Hampstead, Harborne, Leicester, Burnage, Oldham, Warrington, Fallings Park and Chapel Ash. Of these, Letchworth and Hampstead are owned by a company in trust for the inhabitants; Bournville and Earswick are held by a trust for national benefit; Port Sunlight, Coryndon, Knebworth, Fallings Park and Chapel Ash are privately owned; the others are co-partnership enterprises.

ILFORD SEWAGE DISPOSAL

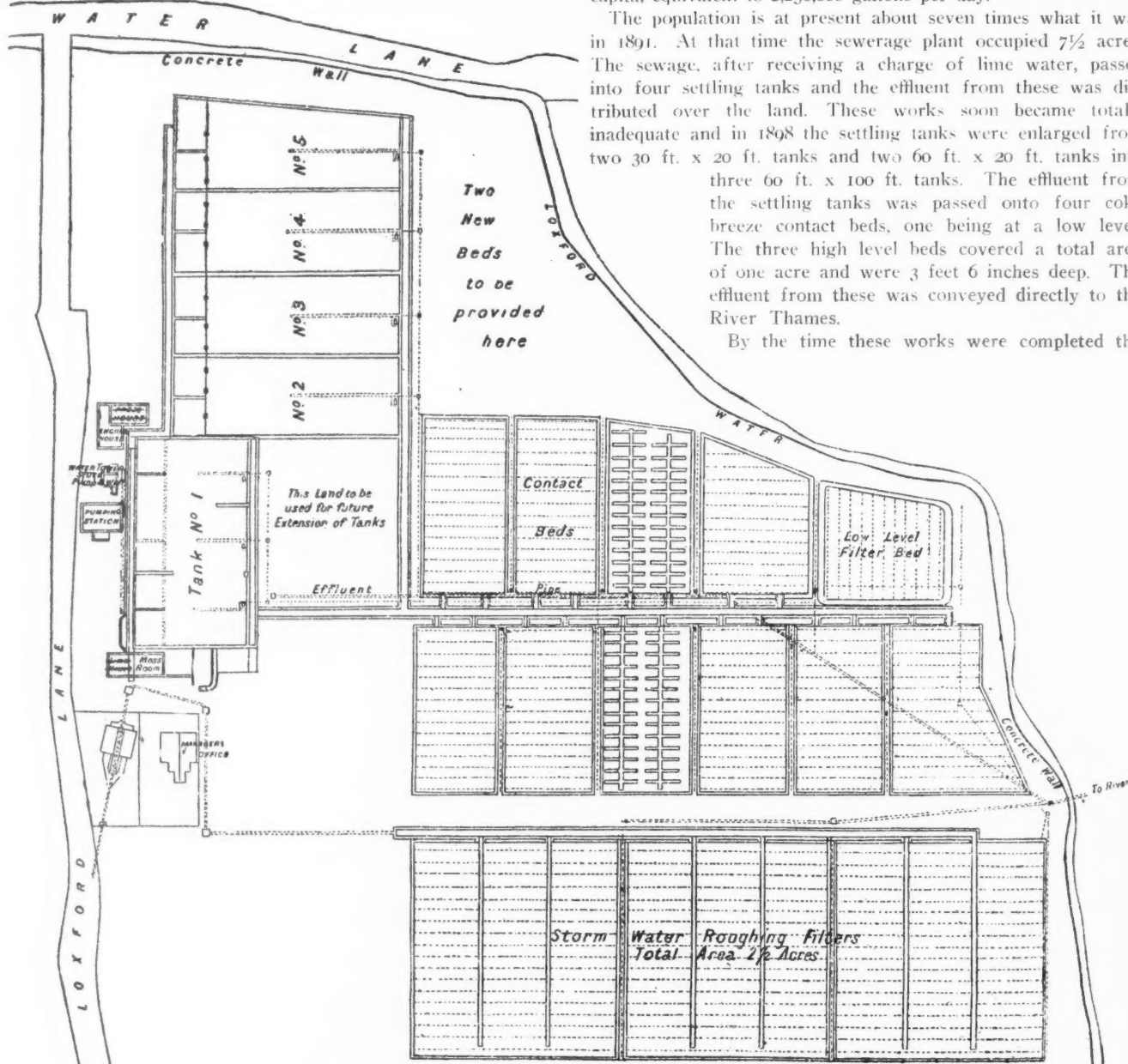
Pumping Plant—Chemical Precipitation Changed to Septic Tanks—Contact Beds to Operate at Eight Hour Intervals, But Now Overworked

ILFORD, England, covers an area of 8,503 acres and has an estimated population of 76,000. The sewerage system of the town serves, in addition to these, an estimated population of 4,000 living in Dagenham. The plant for disposing of the sewage from this area was described by Mr. Herbert Shaw before the Association of Managers of Sewage Disposal Works at a recent meeting, from which paper we prepare the following abstract.

Although the entire area is generally a flat plain, the sewage from about two-thirds of it reaches the plant by gravity. The remaining third is pumped at two stations, one of which is at the disposal works. At the latter are four centrifugal pumps, two 10-inch and two 8-inch, lifting 21 feet and 25 feet respectively, driven by direct acting compound engines of 10 and 8 h.p. At the other pumping station are two 6-inch and two 5-inch centrifugal pumps, belt driven by 25-h.p. and 12½-h.p. motors, respectively. For average dry weather flow, pumping is required 16 hours a day, the night flow being retained in a storage basin. The daily flow is estimated at 28 gallons per capita, equivalent to 2,250,000 gallons per day.

The population is at present about seven times what it was in 1891. At that time the sewerage plant occupied 7½ acres. The sewage, after receiving a charge of lime water, passed into four settling tanks and the effluent from these was distributed over the land. These works soon became totally inadequate and in 1898 the settling tanks were enlarged from two 30 ft. x 20 ft. tanks and two 60 ft. x 20 ft. tanks into three 60 ft. x 100 ft. tanks. The effluent from the settling tanks was passed onto four coke breeze contact beds, one being at a low level. The three high level beds covered a total area of one acre and were 3 feet 6 inches deep. The effluent from these was conveyed directly to the River Thames.

By the time these works were completed the



PLAN OF ILFORD SEWAGE DISPOSAL PLANT

population had so increased that they were already inadequate, and plans were begun for further enlargement to provide for double the existing population. For this purpose about 11 more acres of land were purchased. According to these plans, which have been carried out, the three existing sedimentation tanks were combined into one tank 100 ft. x 180 ft. and two new tanks were added each 100 ft. x 144 ft. The use of chemicals was discontinued and they were operated as open septic tanks. For the filters were substituted $2\frac{1}{2}$ acres of contact beds and $2\frac{1}{2}$ acres of rough screening filters. Later the septic tanks were covered because of the building of residences in the vicinity of the plant.

The sewage passes through double screens, the first having a $\frac{3}{4}$ -inch mesh and the second a $\frac{1}{2}$ -inch. The screens are cleaned by hand. From these the sewer passes through two grit chambers, each 33 feet by 13 feet and 3 feet deep. It is found necessary to clean each of these weekly, and for this purpose a 50-gallon Shone ejector is used to lift the sediment through a height of 12 feet into carts. A 100-gallon Shone ejector lifts the sludge from a sludge pit, a height of 23 feet, and discharges it through 6-inch cast-iron pipes to a lagoon at one corner of the works. The ejectors are provided with compressed air by a twin cylinder air compressor driven by a 4-h.p. oil engine.

The effluent from the septic tanks is distributed upon ten contact beds 5 feet deep. Each of these is worked for nine weeks and then rested one week. They are filled with three feet of hard burned clinker and one foot of coke. The sewage is distributed onto these through 10-inch by 6-inch channels leaving the main channel at 10-foot intervals. These channels are covered with creosoted wood covers and the effluent trickles over their sides. A foot of clinker is placed between and over these distributing channels, but serves no purpose as a filtering medium. These beds were constructed to operate by filling for two hours, resting full two hours, emptying two hours and resting empty two hours. At the present time, however, the volume of sewage is so great that these periods cannot be adhered to and the beds are considerably overworked. To remedy this, two additional filters are being constructed, each having an area of 11,475 square feet.

From these contact beds the effluent passes through 33-inch concrete conduits and iron pipes to the River Thames, three miles away, the topography requiring the use of inverted siphons at two points, one being comparatively short and the other having a length of 800 feet. An unusual feature of this plant is that the sewage is entirely out of sight from the time it enters the plant until it reaches the river.

As is customary in England, special "storm filters" are provided for treating three times the dry weather flow, there being three of these, each 36,000 square feet in area and 3 feet deep.

YARD GARDENS IN CHICAGO

THE Chicago Department of Health, in its *Bulletin* for the week ending August 14, commends the citizens for the very satisfactory way in which they responded to the request for a general cleaning up of the private grounds. In this connection Commissioner W. A. Evans expresses himself as agreeably surprised to find such a large number of yard gardens, which he considers highly commendable, for the reason that "they serve to keep the yard clean, to use up the stable manure, to add to the revenue of the family and to furnish fresh, crisp vegetables for the family table. The increase of such gardens was especially notable in the Eighth Ward. Collections of cans and rubbish and stagnant pools have, in the last two years, given place to small, neat-looking gardens filled with cabbage, onions, parsley, beets and corn, and here and there a fringe or bed of flowers. Seeing this we do not wonder at the lowered baby death rate in the Eighth Ward."

The improvement this year has been very much greater in the better residence areas than in the congested districts, this being due to the fact that the people inhabiting these areas are more amenable to advice regarding care of the baby and, on the whole, enjoy a greater improvement in the milk supply.

AUTOMOBILE FIRE APPARATUS

Abstract of Paper Before International Association of Fire Engineers—More Continuous and Prompt Service—Other Advantages—Care of Apparatus

By JOHN O. GLANVILLE, Chief of Salvage Corps, St. Louis, Mo.

I BELIEVE you will all concede that *quick action* is the most essential feature in fighting a fire, for if all fires were discovered and reached in their inception the losses would be comparatively insignificant. Judging from my own experience during the past eighteen months, I figure that if the time were reduced in getting to a fire after the alarm is received, one-half of the losses would be reduced more than half, and I am sure of the various departments being able to accomplish this by adopting the use of the motor apparatus. What I present for your consideration is not based on theory but *facts*, as I have learned by experience. One motor car will protect three times the territory that horse-drawn apparatus will, and do it very much better owing to the quick operation of the motor, which can make a run in less than half the time of the horse, and, I will add, *much more safely*; and if there is no occasion to hold an apparatus, the return trip can be made just as quickly, the apparatus being ready to respond to other fires that may occur. The number of trips made in a day is of no consequence to the motor apparatus, whereas the horse must be considered, and again, where there are two, three or a general alarm given for the same fire, or two or three fires occur in the same locality in close proximity, the last company to arrive will find the building destroyed, or at least so much so that the belated company has nothing to do but arrange for the return to quarters after giving the horses time to recover the great strain which they have undergone; and at the very best the return trip is made with a crippled service owing to the condition of the horses.

There are other advantages in the use of the motor apparatus, the engine especially. On arriving at a fire it is ready for use regardless of the distance traveled, whether long or short. The man who drives the motor is stoker, engineer and driver, and as soon as a connection is made to the hydrant the motor is ready to pump water at any pressure that may be desired, and a *uniform pressure* can be maintained for an indefinite period. The motor has reached far beyond the experimental stage, and I will add, as a fire apparatus. There are a goodly number in use now in this and foreign countries, and as far as I have been able to learn, the success has been general.

As to the cost of maintenance, I can only give my own experience. With the motor apparatus I am covering three times the territory covered with the horse-drawn apparatus and without increasing the force of men, and doing more effective work. It required four horses to care for one-third of the territory at an annual cost of \$816 for shoeing and feeding, against the total cost of the motor car for one year of \$481.31 (including two accidents, and \$250 of this amount was the result of the accidents).

The reliability of the latter we have in use has proven very satisfactory. During its eighteen months' service we have not had a failure to respond to fires, having responded to 1,050 fires and traveled 2,250 miles in so doing. We have had opportunity to test it under the most severe weather conditions, cold sleet, snow and mud, to all of which the response was marvelous. For instance, on one special call from a very fine country home beyond the city domain, the distance being nine miles from quarters, the run was made and the fire extinguished with a trifling loss, that might have destroyed the entire property which represented \$60,000 to the owners.

The life of the motor apparatus has not yet been determined, it being too new to put a lengthy guarantee on; however, judging from the mileage and endurance of the pleasure motor, which does not get the care that a fire apparatus does, the fire apparatus would serve for twenty years with the ordinary repairs given the horse-drawn apparatus.

I would advise that all fire apparatus be equipped with the largest size pneumatic tires, which are 40 x 6, inflated on demountable rims, so that a change of tire can be made quickly in case of puncture while responding to a fire, and an extra tire should always be carried on all apparatuses; this, however, does not apply to the heavy serial trucks, as the weight is too great for the pneumatic tire.

I might mention a few vital points to be considered in the care of the motor apparatus:

Proper lubrication is one of the most essential factors and should be guarded with much care; the very best lubricant should be provided, care being taken to see that the engine oil contains as little carbon as possible (which is eliminated principally by filtration), and the transmission oils and greases for the running gear are free from acid. In a ball-bearing car, acid in the lubricant will cause the balls to become pitted, destroying the bearing.

Gasoline is another important factor; a high grade should be provided as the cheaper grades also contain carbon, and a like result to the machinery is produced.

The *Tires* should be considered—they should be kept properly inflated at all times, as this adds to the life and they are less susceptible to puncture.

Men to care for the motor apparatus should be properly instructed to care for and drive the motor. This is the all-important feature, but easily accomplished, for the man with ordinary intellect can soon become proficient.

STERILIZING SEWAGE EFFLUENTS

When Considered Necessary—Chlorine Now Considered Most Economical Agent—Conclusions from Investigations—Chlorine Prevents Clogging of Filters

THE subject of the sterilization of sewage effluents was discussed from a practical or engineering standpoint in a paper read recently before the Institution of Municipal Engineers of England by H. C. Shenton. In this he first discussed the evidence for and against sterilization, in which he quoted quite freely from the reports published in the United States, principally Bulletin No. 115 of the Department of Agriculture and the report by Messrs. Phelps and Carpenter published about two years ago. (See MUNICIPAL JOURNAL AND ENGINEER for May 1, 1907.) In this connection he regretted that America and France had taken up the subject much more seriously than had any of the English authorities or experimenters. He did not claim that sterilization was necessary in all cases, but believed that the time was rapidly approaching when it would be considered necessary to sterilize sewage effluents which were discharged into the river above water works intakes, and those which were likely to pollute oysters or other shellfish; referring, as an illustration of the latter, to the decision of Baltimore to sterilize its sewage effluent on account of the oyster beds in the river below the city.

As to the methods of sterilization, he noted that heat, lime, acids, ozone, and both copper and chlorine and their compounds had been proposed at various times, but that at the present time there is a general agreement of opinion that chlorine is the most economical sterilizing agent for sewage. Although ozone for water sterilization had many arguments in its favor, he did not see how ozone purification could compete with hypochlorite of sodium or lime for sterilizing sewage effluents, on account of the large amount of suspended organic matter in the latter. He also described briefly the Hermite process, which consists of electrolytic treatment of a mixture of sodium chloride and magnesium chloride for producing a disinfecting and sterilizing liquid; also the producing of oxychlorides as recommended by Dr. Rideal. His conclusion from experiments with copper sulphate conducted in this country, principally those made by the Ohio Board of Health, was that this method was more expensive than the chlorine methods.

As to the cost of sterilization, he had noticed, as all others

must have done, the great diversity among the figures given by various experimenters and promoters of sterilizing methods; the costs given by these various parties varying from \$1 to \$10 per million gallons. He found that at Marion, O., the cost of sterilizing sewage by chloride of lime was \$6.92, while at Boston it was but \$1.09. Ozone sterilization of water in Philadelphia is reported to have cost from \$10.41 to \$15.62, while it was estimated by Dr. Rideal that in Paris ozone sterilization cost about \$6.93.

As a result of the experiments and researches conducted up to the present time, several conclusions may be arrived at:

(1) That the sterilization of sewage in large quantities is practically and economically possible.

(2) That this may be most economically effected by careful use of chemically-prepared hypochlorite at very small works, and at larger works, or works of moderate size, by the use of electrolytic hypochlorite.

(3) That such treatment may be given where required to tank effluents as will render them inoffensive, and that when necessary such effluents can be sterilized. This is of particular importance in the case of sea outfalls near fisheries or oyster beds, where a very great saving might certainly be effected by sterilizing a good tank effluent from which suspended matters were removed. Such an effluent could not possibly harm the fish, and the cost of filtration would be partly or entirely eliminated. There are many authorities which discharge their sewage into the sea or into tidal estuaries, whose difficulties would vanish if they clearly understood the possibilities of sterilization.

(4) It is possible to remove clogging matter due to growths in filters or in sprinkling apparatus by a strong dose of hypochlorite. This method of cleaning filters or apparatus may be regarded as important, and might be extremely important under certain conditions. It does not appear at present that any other treatment can compare economically with hypochlorite treatment, though, of course, the possibilities of cheapening other processes in the future should be borne in mind.

(5) That sterilization of water by the ozone processes has now been adopted so largely as to leave no doubt as to its practical and economical possibility.

(6) That the sterilization of water by means of electrolytic hypochlorite is also possible, and that though not generally adopted at present the system should be carefully tested, as it would apparently be a cheaper process. For this reason comparative experiments are desirable.

From the facts stated it will be seen that there is abundant evidence that the cost of plant, labor and chemicals in the hypochlorite process are not excessive, and when one remembers the enormous sums which have been cheerfully spent in the past on chemicals added to sewage for precipitation purposes, one is surprised that there should be such an outcry against expense where it is proposed to do so much less in order to obtain a result so much greater.

In discussing this paper, Dr. Rideal called attention to the fact that, in comparing electrical costs of ozone and chlorine, it must not be forgotten that the chemical equivalents of available oxygen and available chlorine were in the ratio of 8 to 35.4, so that the weight of chlorine required for oxidizing work was more than that of ozone; so that a kilo of available chlorine should be compared with 1/24 kilo of oxygen as ozone. On this basis it would appear that there was very little difference between the cost of these two sterilizing agents.

Mr. Shenton had incidentally mentioned that the addition of hypochlorite to septic tank effluents caused the dissolving of growths which clog filters, or at least their reduction to a condition permitting them to be washed from the filters. Also that it had been found that the addition of strong hypochlorite would prevent sprinkling filters from becoming clogged with growths. Several of those discussing the paper referred to this as being to them of more immediate importance than the sterilization of the effluent; since much trouble has been experienced in England, and to a less extent in this country, with such growths. In this connection it is interesting to refer to experiments carried on by Mr. Geo. A. Carpenter, City Engineer of Pawtucket, R. I., on the effect of copper sulphate in preventing the clogging of filter beds by the effluent of septic tanks. The experience here was referred to in our issue of March 11, 1908, the general conclusions after two years of experimenting being that if the underdrains are free from clogging but the sewage bed shows a growth of oscillaria and similar growths, these can be removed by the application of copper sulphate to the sewage; and that the beds can then be kept in excellent condition, so far as these growths are concerned, and can do all that can be naturally expected of the bed in view of its age and its past record, if copper sulphate is kept on hand and applied on the first reappearance of the growths. It appeared to be clearly shown that it was better to apply a large dose at less frequent intervals, rather than a small dose several times a day.

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SEPTEMBER 1, 1909.

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Definite and Enforceable Contracts

A correspondent discusses in a letter on page 331 the matter of grafting by contractors, but considers that connected with the carrying out of the contract rather than with the awarding of it. While blame for the latter attaches chiefly to bidders and members of council, the writer blames the engineers for leaving the door open for dishonesty in connection with carrying out of contracts. There is no question that he is to a large degree correct in his diagnosis. Many have called attention to the opportunity and temptation for graft which are afforded by laws on the statute books which are not really intended to be

strictly enforced, or which it is popularly believed cannot be so enforced. Similar opportunities exist when clauses are introduced in contracts for the purpose of enforcing them only when in the opinion of the engineer this seems to be necessary or desirable.

There is also another class of clauses which are objectionable for much the same reason—those which are so indefinite that they must necessarily be interpreted during construction, it being possible in many cases to purchase from either the engineer or council favorable interpretation of such clauses. Such indefiniteness is objectionable from other considerations also. On page 338 it is stated that because of this, bids for roads in Maryland are higher than necessary because the contractors "are forced to bid high in order to meet any demands that may be made on them." The remedy would be for the city to find out exactly what it wants, specify it, and see that it gets it. Each of these three operations requires exact and expert knowledge of the class of work in question and until the cities are willing to engage and trust their interests to those having such expert knowledge they must be content to suffer under these and other objectionable features in connection with contract work.

Comparing Costs of Municipal Work

One of the advantages of a general keeping of complete records of municipal work would be the possibility offered of comparing the costs, not only in any given city from year to year, but those in various cities. If these records are sufficiently detailed and accurate it is also possible to see just where the difference in cost lies. An illustration of what can be done along this line is given on another page, where the costs of laying water pipe in Massachusetts cities are discussed. In this case it was only at the expense of considerable time given to expert investigation that the more or less incomplete figures were obtained. If it were possible to obtain such data directly from the records of every city, such comparisons would undoubtedly be more numerous and would result in greater economies in many branches of city work or the taxpayers would find out why. City officials who do not wish the trouble or other inconvenience of economizing will naturally oppose records which will make it easy to discover their shortcomings. Those who are anxious to do their best by the city and believe that a record of their work will compare favorably with that in other cities should, it seems to us, be heartily in favor of such records. We do not claim that a division of officials into these two classes could be made strictly on the basis of their opinions concerning the advisability of keeping such records; but we think such opinions might be accepted as evidence of greater or less weight.

Testing Fire Hose

News items from Council Bluffs, Iowa, and Portsmouth, Va., in this issue, tell of the handicapping of the work of firemen by defective fire hydrants in one case and by rotten hose in the other. It is stated that in the former the fire hydrants are tested twice a year, and this incident would seem to indicate the desirability of conducting such tests once a month. It is not, we believe, the common practice to test fire hose, but it seems to us that this also should be tested at frequent intervals. If each length of hose is identified, say by a number stamped upon the coupling, and such a number of lengths is tested once a week, that each length will be put to test at least twice a year, a record being kept of all such tests, together with the date of purchase and date of failure, we cannot doubt that there will be much fewer instances of hose bursting at fires; also, the records would show what class and make of hose gives the longest and most efficient life, which data should be used in making purchases of new hose. We would suggest that the testing of the fire hydrants and the test of the hose could be made at one and the same time, the water used being turned into the sewer and thus serving to flush the latter, in many cases to its advantage.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Police and Fire Items—Government and Finance

ROADS AND PAVEMENTS

Scarcity of Laborers Delays Work

Akron, O.—Because of a congestion of work caused by delays in securing bond ordinances several streets for which contracts for paving have been let may not be paved this fall. A scarcity of laborers has also hindered street paving. Contractors say that they are unable to get enough men to work on the streets.

Reason for High Bids for Maryland Roads

Baltimore, Md.—Complaints are being made by contractors of the specifications under which they secure contracts to do work on the roads under the State Roads Commission. They say that so much arbitrary power is left in the hands of the Roads Engineer that they are forced to bid high in order to meet any demands that may be made on them and lose no money in the venture. Crushed stone is also proving an item of expense that is worrying every one. It costs as much to get it from the quarries along the Susquehanna River as it does to bring it into Maryland from the mines along the Schuylkill, in Pennsylvania. This condition will probably be met by the State opening up quarries of its own, to be worked by the inmates of penal institutions. Some legislation will be required for this. It will probably be secured at the next session of the General Assembly.

Edmondson Avenue Bridge Over Half Built

Baltimore, Md.—More than half of the work on the Edmondson avenue bridge has been done and the whole structure will be finished before winter. In order to keep the way open for traffic along Edmondson avenue the bridge was built in two sections. At first the north truss of the old span was taken down, the south side being left for the passage of the cars and other vehicles. Then the entire half of the new concrete bridge was erected. The traffic was then diverted on to the new section, the south trusses of the old structure removed and the contractors proceeded to complete the work. When completed the bridge will be 60 feet wide, 60 feet high and 540 feet long, and will cost about \$200,000. The roadbed will be 44 feet wide, carrying two street railroad tracks. The parapet wall will be of concrete, two feet thick, on top of which will be a coping made on the ground and set in place like natural stone. At present the north side of this parapet, which has been completed, is being bush-hammered with pneumatic tools. By this process the gloss of the concrete is removed, cracks and fissures are closed and the surface is given a compact, granite-like appearance. As soon as the two remaining arches are finished side walls will be erected to serve the purpose of concealing the interior parts of the structure and giving a solid aspect to the whole work. A feature of the construction is that the centers of the arches used in the erection of the north half of the new bridge were shifted transversely and used again without alteration for



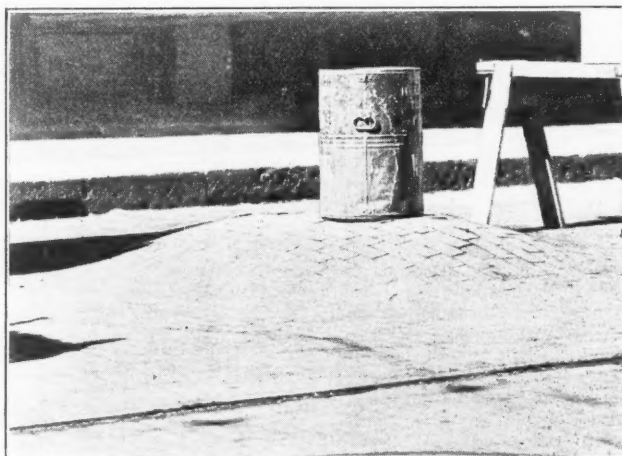
Courtesy Baltimore News

FINISHED SIDE, EDMONDSON AVENUE BRIDGE

the work on the other side. Plans are under way for the improvement and beautification of the land in the vicinity of the new bridge.

Sections of Wood Pavement Show Effect of Sun's Heat

Boston, Mass.—Following the example of the wood block pavement on Water street, the pavement in Park Square became overheated and found vent in four large blisters about a foot and a half high. The biggest of the blisters was about four feet in diameter. The attention of the Street Department was called to the phenomena, and protection was placed about them; but previous to this playful pedestrians, in order to test the elasticity of the pavement mushrooms, crushed one of them.



Courtesy Boston Herald

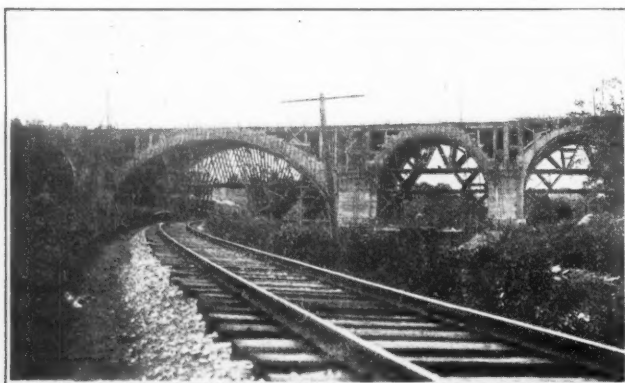
HUMP IN WOOD PAVEMENT CAUSED BY HEAT

The Easy Way to Abolish Grade Crossings

Lawrence, Mass.—With an itinerary including Malden, East Cambridge, Belmont, Northampton and Ayer Junction, where grade crossings were voluntarily abolished by the Boston & Maine Railroad, the members of the Lawrence Grade Crossing Commission, accompanied by Mayor William P. White, Vice-President Frank Barr and other officials of the Boston & Maine Railroad and a deputation of the Lawrence Board of Trade, conducted a highly successful tour of inspection in Vice-President Barr's private observation car. That the journey was well worth the time will not be denied by the representative professional and business men who were present, and that the next few years will see the complete abolition of grade crossings in Lawrence was the general prediction of all after the aforementioned cities and towns were toured and evidence procured to show where it is better when agitating the abolishment of grade crossings to co-operate with the railroad officials instead of brow-beating them through the courts.

To Oil Connecticut State Roads

Hartford, Conn.—State Highway Commissioner MacDonald of Connecticut has purchased a large quantity of crude oil and distributing apparatus and will spray sections of the main heavy traveled highway in an endeavor to render the roads dustless.



Courtesy Baltimore News

UNFINISHED SIDE, EDMONDSON AVENUE BRIDGE

Passes Ordinance to Protect Pavements

Camden, N. J.—An ordinance has been passed making it unlawful for any one to drive a business wagon, truck, dray or other heavy vehicle on any asphalt street in the City of Camden where a trolley track is laid, with one wheel or pair of wheels on such trolley track and with the other wheel or pair of wheels on the asphalt pavement laid on such street, under a penalty of \$25 and costs of prosecution.

Asphalt Is Satisfactory in Car Tracks

Milwaukee, Wis.—The Board of Public Works spent several hours making an inspection of car track streets throughout the city and gathering material to be used in combating the Fess resolution to exclude asphalt from car track streets, which comes up for hearing before the Council Committee on Streets and Alleys. "The Board found," said Commissioner J. P. Sherer later, "that the trouble with street pavements adjoining car tracks has been due to the fact that public necessity compels the use of the car tracks before the foundation has had time to properly settle. Heavy cars running over the freshly laid tracks naturally loosen the foundations, and no matter what kind of pavement is used the result will be the same. We shall recommend that the form of construction be changed so that the granite blocks laid along the rail shall be laid parallel with it instead of 'toothed,' as is done at present. Under the present system wagons sometimes strike the ends of the block and loosen it. With these slight changes we are satisfied that there will be no more trouble along the street car tracks, no matter what kind of pavement is used."

Paving Specifications Altered

Newark, N. J.—James W. Howard, Consulting Engineer, appeared before the Board of Works to complain about the way the specifications and contracts for street paving are drawn. He declared that while the specifications call for certain requirements and qualifications they also specify the style of material to be used. Mr. Howard said this was wrong, and that the qualifications of the materials to be used was sufficient. He cited the case of Mount Pleasant avenue, where the city lost \$35,000 because of a defect in contract phrasing and insisted the same situation might arise again unless the contracts were changed. Chief Engineer Sherrerd told him the changes had been made.

Take Sidewalk Census of Traffic

Norfolk, Va.—A census of sidewalk traffic was taken at the Atlantic Hotel, Main and Granby streets, between 2 and 4 o'clock p. m. on six successive days. The figures were as follows: 5,505, 3,759, 5,600, 4,400, 4,470 and 5,000; average, 4,789. The census is taken to indicate an unusually heavy traffic for a city of its size, of less than 80,000 inhabitants.

Opposes Contract for Asphalt Macadam

Trenton, N. J.—Counselor John H. Backes has filed with City Solicitor Charles E. Bird the several petitions upon which he will apply to the Supreme Court in an effort to prevent the execution of recent city paving contracts awarded to the Filbert Paving and Construction Company. In addition to their affidavits and those of McGovern, whom Mr. Backes represents, setting forth the details of the Councilmanic award of the work and protesting against the legality of the proceedings, Mr. Backes has appended a sworn statement of his own, in which he declares that he has been creditably informed that "Filbertine" is a "fake." This information, he sets out, was obtained from a recognized street paving expert, who said that he had made a careful analysis of the so-called "Filbertine" and found it to contain absolutely no special merit, and in fact no quality not possessed by any other combination of good sand, stone and asphaltic cement.

Taking Traffic Census of State Highways

Worcester, Mass.—The State Highway Commissioners are to begin to take a census of the traffic on the principal roads of Worcester County, paying particular attention to the amount of auto traffic. The count will be kept up for a week by a corps of young folks in charge of J. H. Johnston, of this city. The enumeration will work in relays of two hours each and they will keep track of the vehicles that pass their stations and forward their reports to the Highway Commissioners, who will tabulate the returns from all over the State next November.

SEWERAGE AND SANITATION**Unable to Trace Source of Typhoid**

Indianapolis, Ind.—The City Board of Health is wrestling with the question of determining the cause of a sudden but not alarming increase in the number of cases of typhoid fever in the city. There have been 35 cases reported before the end of August, while the total number of new cases during July was 24. Usually in typhoid fever cases it is found that the water or milk supply is bad. Neither has proved to be the case in the present instance and the Board is now trying to determine whether or not ice cream might have been the cause, without expecting to find that to be a fact. Cases reported have been well scattered over the city. In 11 instances the patients drank water from wells, but no trace of typhoid bacilli have been found in the water. In three cases milk was obtained from the same dairy, but an inspection of the dairy revealed that the milk was clean and that the surrounding conditions were satisfactory.

Sewage Disposal Plant Is Invisible

Ocean Grove, N. J.—Ocean Grove has taken another step in advance of her seaside rivals. She has recently completed a sewage disposal plant for treating the sewage from the Grove before the same is emptied into the ocean. As a result the bathing at Ocean Grove is much more attractive than at any of the other resorts along the sea, where modern sewage disposal plants have not yet been put in operation. The disposal plant, built of concrete, is under the roadbed of Ocean avenue, at the junction of Embury avenue, and it is wholly beneath the ground, the only portion exposed being three manhole covers similar to the ordinary electric light conduit manholes. Thousands of persons pass and repass the plant every day without being aware of its existence. The main building, underground, comprising the plant, is 110 feet long by 60 feet wide, and is about nine feet deep, the bottom being four feet below mean tide, and the roof six feet beneath the boardwalk.

Spring Water Cause of Five Typhoid Cases

Scranton, Pa.—Dr. W. E. Keller, Superintendent of the Bureau of Health, has succeeded in tracing and wiping out a plague spot in South Scranton after five cases of typhoid fever had developed from it. The spot was a spring along the Laurel Line tracks, between Prospect and Stone avenues, where the people of the neighborhood obtained their supply of drinking water. Dr. Keller found that the spring was fed in part by overflow from an open sewer. He took samples of the water and had the City Bacteriologist analyze it. The result was the finding of colon bacilli in profuse numbers.

WATER SUPPLY**Filtration Will Be Necessary in Baltimore**

Baltimore, Md.—Frederic P. Stearns and John R. Freeman, consulting engineers for the Water Board, and Allen Hazen announce that filtration is the only effective means of purifying the Gunpowder water supply. In the past it has been customary for Baltimore to use from Lock Raven only the clear water that is allowed to settle, while the turbid water has been allowed to waste over the dam. The filtration plant will add \$1,000,000 to Engineer Quick's estimate of the cost of the new water works.

Contemplate Buying All Property Adjoining Reservoir

Claremont, N. H.—The question in regard to bettering the existing conditions about the reservoirs has been before the Water Commissioners for some time. They have already taken some land that adjoins the brook from the upper to the second reservoir, and now it is contemplated taking the entire farm of Arthur Fitch so that the town will own the entire watershed about the upper reservoir. The Fitch farm is of about 240 acres, considerable tillage and growing timber, a large farmhouse and several barns. The reported price for the place is \$5,000. People familiar with the situation about the water plant think it advisable for the town to buy all the property adjoining the reservoirs.

Forest Hill Reservoir Will Be Finished in a Year

Baltimore, Md.—The accompanying illustration shows the progress of work on the Forest Park reservoir, located east of Forest Park, south of Liberty road and west of Slingluff avenue. About a year will be required to finish the work. A force of between three and four hundred men are now employed. The dam when completed will be in the shape of a horseshoe, 500 feet from end to end. From the bottom of the water to the top will be 75 feet. The excavation trench shown in the cut is for the core of the dam. A stream is being diverted and turned into a sewer to keep the reservoir free from contamination. It is planned to make the reservoir one of the most picturesque sights in the city. Its sloping side on an average of about 15 feet down from the surface of the earth will be covered with top soil and planted with grass. Just below the bottom line of the grass



Courtesy Baltimore News

CONSTRUCTION OF FOREST PARK RESERVOIR

a wide berm will be built. On this a cement walk five feet in width will be laid. Standing on the walk the ground above cannot be seen. The surface of the water will be but a few feet below this berm. It is planned to encircle the reservoir with a driveway over a mile in length. Of the 700,000 cubic yards of earth that will have been excavated upon completion, about half has already been taken out. It will hold enough water to provide the whole western section of the city. Its capacity will be 225,000,000 gallons, with an average depth of over 30 feet. Exactly what the undertaking will cost the city cannot be determined before its completion, but it is thought that the amount will not much exceed \$500,000.

Collingswood's Water Problem Serious

Collingswood, N. J.—The Finance Committee of the Citizens' League, of which William B. Oliver is chairman, has issued a letter on the water situation here, in which it is stated that the water question is more serious than ever, and that J. J. Burleigh, of the General Water Supply Company, has admitted to the committee that the Merchantville plant is not able to take care of the community and that he is relying on Camden, and in case that failed, on the old Haddonfield plant. Camden has refused to bind itself to supply the town's needs for more than 24 hours. And the committee has been advised by Haddonfield that they absolutely have none to spare. As it now stands, Collingswood is a town practically without a water supply. Members of the committee have found water of the finest kind and in abundance in their town, but to get it into the homes they must have the co-operation of the citizens and property owners. Citizens are asked to help pay for the preliminary work that is being done. Five hundred dollars is needed, and \$1 from every citizen that has not contributed is requested.

Sixteen-Inch Water Main Breaks

Philadelphia, Pa.—A 16-inch water main at Letterly and Sepviva streets burst August 17, doing considerable damage for a distance of a block. Cellars were flooded, cellar walls fell and sidewalks caved in. The break occurred at 5 o'clock in the morning and people were awakened by the sound of the water and rushed from their homes.

Meter System to Save Additional Filters

Pittsburg, Pa.—Mayor Magee is about to put through a plan by which it is expected the city will save \$1,500,000. He contemplates abandoning the administration's previous plan of increasing the capacity of the filtration plant either with about 14 more slow sand filters, coagulation filtration, or preliminary sand filtration. As a substitute, an ordinance may be introduced in Councils compelling consumers to use water meters, or the general voluntary use of meters obtained. Instead of increasing the supply the Mayor hopes to reduce the consumption. He reasons that if the consumption is reduced sufficiently there will be no need for additional capacity for the plant. The plan does not involve the abandoning of the 10 new beds now under construction to supply the Northside with filtered water.

Mayor Takes Contract to Lay Mains

Portland, Ore.—Mayor Joseph Simons has carried out his threat of bidding for contracts in order to break up an alleged combine of contractors, who, he says, are charging too high prices. The Mayor was the low bidder on a \$4,300 contract for laying a water main, his bid being \$400 below the next bid, and was the only bid below the engineer's estimate. After paying for labor and materials, if any balance remains he will turn it into the water fund.

San Francisco's Rights in Hetch-Hetchy Recognized

San Francisco, Cal.—City Engineer Marsden Manson succeeded through Mr. Stockslager, the city's representative at Washington, in straightening out some of the misapprehensions regarding the occupancy of the dam site at Lake Eleanor, the clearing of the same, and the construction of temporary buildings at that point. Assistant Engineer Jones has been instructed to proceed with this work as rapidly as possible. The cutting of timber is permitted within the dam site, provided the same be paid for at rates fixed by the Forestry Service. The Forestry Service has therefore been requested to cruise and determine the value of this timber, and Mr. Jones will define the exact reservoir limits within which this work is to be done. Anticipating favorable action in this matter, materials and additional tools have been forwarded.

Shenandoah Expects to Avoid Its Annual Drought

Shenandoah, Pa.—At a depth of 363 feet the artesian well borehole of the Shenandoah Water Company gushed water at the rate of 86,400 gallons daily, and it will be sunk to a depth of 600 feet. Two more wells have been contracted for. The water company officials are jubilant, and are now confident of overcoming the annual drought, which caused great distress to residents of this city and stopped collieries and other industries.

Work Advancing Well on Little River Contracts

Springfield, Mass.—There is a pleased expression upon the faces of the engineers who are superintending the work on the Little River water works these days, for the work is going on so well that it is confidently expected that it will be completed within contract time. Although Chief Engineer Lochridge is not yet ready to set a date when the system will be ready for use, it is confidently expected that Little River water will be turned on in January. Only one part of the work is uncontracted for, that being the construction of the caretaker's house at the works.

Miles of Streets and Thousands of Homes Without Water

Atlanta, Ga.—General Manager Park Woodward, of the Water Works Department, has just finished compiling a full list of all the streets in the city which are without water. The list shows that there are 98 miles of improved streets without water, and on these streets are 4,898 houses. Of the unimproved streets there are three miles without water, and on these streets there are 3,000 houses. That is, there are, altogether, in Atlanta 101 miles of streets without water, with a total number of homes without water of 7,898.

Connecting with Relaid Mains

Washington, D. C.—In case a new water main is laid as a result of a change in grade of a street, the Engineer Department of the District Government holds that adjoining property owners must pay for their new connections with the new main, but this expense can be claimed as damages before the grade damage claims commission.

STREET LIGHTING AND POWER

City Disposes of Assets Before Annexation

Birmingham, Ala.—The town of North Birmingham has created a sensation by the sale of the water and electric light plant to a private corporation for the sum of \$1 and the bonded indebtedness of \$190,000. The sale has not yet been formally closed, but a resolution authorizing the sale has been passed by the Council in an adjourned session, called immediately after the announcement was made that North Birmingham had been included in the Greater Birmingham bill. The reason given for the hurried transfer of the property is that it is feared that the greater city will transfer the property to the two large Birmingham water and light corporations and that the rates for service will be advanced. North Birmingham is furnishing light and water to its citizens at about half the price charged by the Birmingham corporations. The city officials of Birmingham are active, and will prevent the final transfer of the property if possible.

Preparing Data for Electrolysis Litigation

Dayton, O.—So that the city will be in position to fight the railways on the proposition of electrolysis, a record is to be maintained by the city of pipes discovered to be affected by this condition. President Ely of the Service Board ordered William J. Harris, manager of the Water Works Department, to establish such a record. The plan is for Construction Superintendent T. J. Heffernan to tab the discoveries when made. In case of extensions to mains, or where repairs are made because of leaks in the main the official is to make a minute record of the condition, showing just what caused the leak. The servers are doing this so that data will be at hand in case the city should go to trial with the railways on the electrolysis cases.

City to Be Blaze of Light

New York, N. Y.—Rapid progress is being made toward the fulfillment of the promise to make Greater New York the most brilliantly lighted city in the world during the Hudson-Fulton celebration. Thousands of skilled workmen, electricians and laborers are busy stringing lights on the public buildings in all the boroughs, and this work is fast approaching completion. The wiring of the four bridges over the East River will be finished in a week or ten days. Fully 500,000 lamps will be used in this public illumination. The battery of scintillators which will cast their rays on the Palisades will consist of nearly 100 high-power searchlights of several hundred thousand candle-power. Nor is private enthusiasm lacking in showing itself in this form. All along the North River the great steamship and railroad piers are being strung with electric lights. New York's well-known citizens living along the Hudson River are making contracts for big illuminations so that the Hudson at night will be brilliant with light.

GOVERNMENT AND FINANCE

Atlantic City's Increased Budget

Atlantic City, N. J.—Nearly \$2,000,000 will be needed to maintain the finest resort city in the country, according to the tax budget which was given in recently. On this as a basis the taxes for the year will be figured. To be exact, the sum is \$1,690,000, which exceeds last year's amount by \$218,000. Additions desired by several departments of the city may cause this sum to be increased, unless City Council gets out the pruning knife and weeds out several items in an effort to keep the tax rate down.

New Tax Rates in Massachusetts

Boston, Mass.—An official statement of the tax rates for 162 cities and towns in Massachusetts has been announced. Of this total 63 announce increased rates, in 81 the rates are reduced and in 18 it remains the same.

City Commission Defeated

Montgomery, Ala.—By an overwhelming vote the House indefinitely postponed action on the bill providing a commission form of government for the leading cities of Alabama. It is doubtful if the matter will come up again.

To Study Chicago's Finances

Chicago, Ill.—Mayor Busse has appointed 10 members of a commission to investigate the expenditures of the city's revenue. It is the desire of the city officials to expend large sums in the next few years in improving the transportation facilities and in beautifying the city, and an accurate account of the city's finances is desired before any move is made to increase the bonded indebtedness of the municipality. Under a law passed by the last Legislature the city is empowered to increase its bonded debt by \$16,000,000. Those named on the commission are Alderman Charles E. Merriam, professor of political economy at the University of Chicago; Alderman H. W. Snow, chairman of the City Council Finance Committee; Alderman Nicholas Finn, Walter L. Fisher, special traction counsel; City Comptroller Wilson, Frank I. Bennett, A. C. Bartlett, W. A. Tilden, G. A. Tunell and John W. Alvord.

Norwood Tax Rate Is Reduced to \$10

Norwood, Mass.—Public-spirited action on the part of the residents of Norwood has resulted in the reduction of the tax rate from \$25.60, last year's rate, to about \$10 for this year, which is one of the lowest rates in the State. The total valuation of property is placed at about \$13,000,000. Last year the valuation was but \$6,000,000, of which only about \$1,000,000 was personal property. The Tax Commissioner of the State called the attention of the taxpayers to the fact that Milton has about the same amount of real estate as personal property, while Norwood had but one-sixth as much personal as real estate. This led to an investigation by a committee of citizens with the result that with public-spirited action a readjustment of values was made.

Proposes to Elect City Trustees at Large

Sacramento, Cal.—Mayor Clinton L. White is having a petition circulated among the voters of the city asking the Trustees to submit to the electors an amendment to the City Charter providing that Trustees be elected at large instead of by wards, as at present. According to the amendment proposed, Trustees must be residents of the wards they represent, but shall be elected by all the voters of the city.

Favors Recall of City Trustees

Vallejo, Cal.—The Trades Labor Council of Vallejo has unanimously endorsed a movement for the recall of City Trustees J. F. Deinger, John Sullivan, J. A. Brownlie and J. F. O'Reilly because they refused to vote in favor of a franchise for the Independent Ferry Company, sought by Theodore A. Bell, who represented a company which desired to obtain the privilege of operating a second ferry between Vallejo and Mare Island. The request for the recall of the Trustees was presented by the Machinists' Union and preparations are being made to submit the matter. If the signatures of 25 per cent of the voters who participated in the last election are secured the petition will be submitted to the Trustees, who are obliged to call a special recall election.

Anti-Smoke Ordinance Passed

Evansville, Ind.—An anti-smoke ordinance has been passed, to which the following proviso is added: That in any suit or proceeding under this ordinance it shall be a good defense if the person charged with violation thereof show to the satisfaction of the court trying the case that there is no practical device, appliance, means or method by the application of which to his building, establishment or premises the emission or discharge of the thick, black smoke complained of in that proceeding could have been prevented.

Invites Every Mayor to Attend Centennial

St. Louis, Mo.—Mayor Kriessman has invited the Mayor of every American city to attend the centennial celebration, October 3-9, 1909, of the incorporation of St. Louis as a city. The purpose, primarily, is to make this the biggest possible assembling of Mayors, and special conferences will be had by these chief executives, at which addresses will be delivered. The Mayors are to be assigned to delegations of St. Louis citizens upon their arrival, who will look after them. It is expected that this will be the greatest gathering of Mayors ever assembled.

FIRE AND POLICE

Chicago's New Chief Outlines His Policy

Chicago, Ill.—General Superintendent of Police Leroy T. Steward, who took his oath of office immediately after his appointment was confirmed by the City Council, announced that he would take up the duties of his office at once. The new Chief announced his policy as follows: Mayor Busse's views on the open Sunday question to be followed. Public gambling to be suppressed, but there will be no interference with card playing at home or in clubs. Strict discipline to be enforced in the Department. "Protection" for gamblers or keepers of resorts must come to an end. Politics not to be allowed to interfere with police work. Rigid segregation of vice resorts. Discharge of lazy policemen.

Fire Plug Test Once a Month

Council Bluffs, Ia.—More frequent testing of fire plugs is to be made in the city if plans of the Fire and Lights Committee of the Council are carried out. The matter was brought up at the meeting of the Council when the question of testing fire plugs was suggested by Alderman Younkerman, who called attention to a report that at a fire some time since a fire plug to which hose was attached proved to be stopped up, and because of the delay in getting water considerable damage was done which could have been prevented if a stream could have been thrown on the fire at once. It has been the rule with the Fire Department to make an inspection of fire plugs twice each year. The work is done each spring and fall. Where defects are discovered report of such matters are made to the water works company, so that repairs may be made.

In Favor of Gun Toting

Hutchinson, Kan.—Chief George Hern believes that a citizen with a gun is an added protection to the city, and has announced that he has no objection to "gun toting" so long as the weapons are in the proper hands. "No reputable citizen will have any trouble with the Police Department for carrying a gun," he said. "I don't approve of boys carrying guns and won't allow it; but if a property owner thinks he needs protection there will be no objection to his carrying a revolver and using it properly. This isn't permission for lawbreakers to carry weapons nor for men to carry them when there is no necessity for it."

Burst Thirteen Sections of Hose

Portsmouth, Va.—Mayor Reed has expressed a determination to have some sort of an investigation into the difficulty which the firemen of the city department experienced with bursting hose at a recent conflagration. Six hundred and fifty feet of hose went temporarily out of commission when 13 sections of 50 feet each burst at the fire, seriously handicapping the work of the fire fighters, who were necessarily delayed in uncoupling the bursted sections and replacing them with new, thus completing their lines with serviceable hose. The Mayor wants to know how much dependable hose there is in the city.

Municipal Parade

Schenectady, N. Y.—The carnival committee has arranged with the municipal authorities for the annual inspection of the Police and Fire Departments on October 2, the last day of the carnival. The parade will take place in the afternoon of that day and promises to lend not a little additional interest to the many features promised. The new gasoline fire engine, the first of its kind in use in this country, will be seen in the parade, and is certain to attract unusual attention, especially among visitors to the city.

Want Firemen to Account

Wilmington, Del.—City Solicitor Brady and the members of the Fire Committee of City Council have held a conference to draw up the form of contract to be entered into with the fire companies of the city for the ensuing year, at which it developed that the firemen make no accounting to the city as to the manner in which they spend the money the city appropriates to each company every year. The contracts will be the first entered into with the fire companies under the act passed by the last Legislature, providing that the companies must agree to furnish sufficient protection for a city in return for the money allowed them.

Town Fire House Misfit

Lansdale, Pa.—The citizens of this town and all along the North Penn are enjoying a joke at the expense of Town Council. After shifting several years with a small chemical fire engine the town fathers last spring decided to take a step forward and gave a contract for a regular fire engine and a building to house it. The Fairmount Fire Company was duly organized, a fire house built and formally opened and a signal system tested, all accompanied by the usual entertainment, parade and refreshments. This was all as it should be. But this was before the engine had arrived. It arrived several days ago. So did surprise, consternation and ridicule. The engine was too large for the house, or the house too small for the engine. Explanations were asked for, but Councilmen, Burgess, architect and Fire Chief all point their thumbs over their shoulders with an air of "Let George do it." Several ways out of the difficulty are suggested. The ceiling of the fire house might be raised, the floor lowered or the engine stack amputated. Council is still undecided as to which.

Electric Lights to Flash Fire Alarm

Lawrence, Mass.—Fire Chief Hamilton has installed a unique fire alarm box and signal system on Essex street. New boxes are installed, upon each of which is a red electric light. These lights will flash at each stroke of the alarm, so that it will be possible to learn the box by just watching the light. On the south side of Essex street, near the transfer station, will be a large gong on a box to be located there. This gong will ring at every alarm, and can be heard for a distance of 100 yards, as a signal to street cars and other traffic to look out for the apparatus.

Accident at Fire Department Exhibition

Manchester, N. H.—While making an exhibition hitch at the central fire station for the entertainment of the delegates attending a convention of the Order of Scottish Clans a three-horse hitch drawing a five-ton fire engine became unmanageable and plunged into the thick of the crowd of 3,000 people viewing the exhibition. The driver was pitched from his seat and severely injured, as was also one spectator. The fire engine was wrecked.

Nashville Police in Plain Clothes

Nashville, Tenn.—In accordance with an order issued by Mayor James S. Brown, the entire police force will hereafter report for duty in plain clothes, discarding both uniforms and clubs, but retaining their badges. Mayor Brown's action was due to his belief that, in efforts to detect the violations of the State wide prohibition law, an officer is hampered by his uniform. It is reported that drinks are being quietly sold in every section of the city.

High-Pressure System Officially Completed

Philadelphia, Pa.—Chief Dunlap, of the Water Bureau, has sent official notification to Charles A. Hexamer, secretary of the Philadelphia Fire Underwriters' Association, of the completion of extensions to the high-pressure fire main system in the center of the city. The underwriters have refrained from announcing any rate reduction because they had received no "official notice."

Life Lines for City's Bridges

Dayton, O.—The city authorities are to be asked to provide equipment such as life lines, nets, hooks, etc., at each bridge in the city, river and canal, with the idea of eliminating or at least reducing the number of drowning cases. Statistics show that the great majority of drowning cases in the city occurred at or near bridges in the city.

Urge Motor Vehicles

Washington, D. C.—When the estimates for the District for the next fiscal year go to Congress the Commissioners probably will recommend that horse-drawn vehicles, such as ambulances, fire wagons, engines, trucks and patrol wagons, be replaced by motor vehicles. Both the Superintendent of Police and the Chief of the Fire Department will make such recommendations in their next annual reports. Major Sylvester will ask for several motor patrol wagons. Fire Chief Wagner will recommend that all hose and chemical wagons be motor-driven. He is also in favor of motor trucks and engines. The authorities in charge of hospitals believe that many lives could be saved if motor ambulances were used.

REFUSE COLLECTION AND DISPOSAL

Genuine White Wings Clean Streets

Lakeview, O.—Recently the finances of the village fell to such a low ebb that it was impossible to longer employ a street sweeper, so his services were dispensed with. Still there remained a few dollars in the Treasury. One of the Aldermen proposed that the money be invested in a flock of ducks which would forage the streets and eat the rubbish. Lean ducks were bought and turned loose in the streets. They start in to eat the waste from the streets at one end of town early in the morning and eat to the other end, when they are turned backward or shifted to another street.

New Garbage Law Is Framed

Pasadena, Cal.—Councilman Cattell has introduced a new garbage ordinance fixing the monthly license fee for each wagon engaged in hauling of garbage at \$25 per month, payable in advance. Garbage shall include all table refuse, offal, swill and accumulation of animal, vegetable and other matter that attends the preparation, consumption and decay of storage of fruits, meats, fowls, fish or vegetables or dead animals. The penalty attached to the ordinance is a fine of not more than \$500 or imprisonment in the city jail for a period of not more than 90 days or both, at the discretion of the Court.

RAPID TRANSIT

Street Railways Will Protect Scenery

Boston, Mass.—Street railway companies in Massachusetts have offered to aid the State in its battle against forest fires. The State has accepted the offer, and general orders have gone forth to many of the railway superintendents to begin the work of co-operation at once on a well-planned system. This move on the part of the railway companies places a commercial value on rural scenes. It is to protect scenery, because it attracts the people and creates traffic for the companies.

Subway Referendum

Cleveland, O.—A referendum election on the subway grant made to the Cleveland Underground Rapid Transit Company was assured when Clerk A. J. Haas of the Board of Elections reported to Mayor Johnson that enough names of qualified voters had been found in the petition to render a call necessary. The subway referendum will be held in connection with the next general election on November 2.

Four Interurban Roads to Enter Columbus

Columbus, O.—With the advent of good times, Columbus expects to get four interurban railroads. Cincinnati capitalists behind the proposition of building a direct line connecting that city with Columbus are proceeding slowly but surely with the perfection of their plans, and already secured a number of franchises in the cities on the way. Two new lines are projected to the northwest, one toward Urbana with an ultimate Toledo connection in view, these to connect with the Columbus, Urbana & Western at its present terminus at the Fishinger Mill Bridge. Another projected line is to connect with Dublin.

Railroads Have No Right to Eject Passenger

Dayton, O.—Street railways have no right under the law to eject any passenger from cars when the latter refuses to pay his fare or the transfer offered is not in accordance with the rules laid down by the corporation. The only recourse they have is in filing a charge against the offending passenger and causing his arrest. This is the essence of an opinion just sent to J. W. Dalton, of 621 North Williams street, by City Solicitor Burnham. It is in reply to a complaint made by Mr. Dalton. He alleged that the People's Railway Company refused to take a transfer from him issued by the Oakwood Railway Company recently. The coupon was offered to the Wayne avenue line going north, Mr. Dalton boarding the car at Third and Jefferson streets. The conductor told Mr. Dalton that he was under instructions to take such coupons only at Fifth and Jefferson or at First and Jefferson from the Oakwood line. Mr. Dalton refused to leave the car when the transfer was refused, and he says he was put off. The Solicitor holds that the company is violating the transfer ordinance by such a ruling. He has been seeking a method whereby some judicial ruling on the transfer law could be obtained.

Railway Commission Tries Arbitration

Dayton, O.—A plan of arbitration of the differences existing between the city and the Ohio Electric Railway Company was offered to the municipality by O. P. Gothlin and J. C. Sullivan, of the Ohio Railway Commission, at the City Hall recently. The wrangle over the proposed 10-minute service on South Main street and the demands made by the railway company for such service formed the subject of the Commissioners' conference with City Councilmen. As a means of settling the controversy the Railway Commission recommended that the city give the railway company at once the right to relay its tracks on South Main street with a "10-point center." The city shall also give the railway, when it applies for it, the right to make the necessary extensions to connect with its new freight station near Fourth street and the canal. In return the city is to receive 10-minute service. The representatives of the Railway Commission insisted that the application of the Ohio Electric Company for 25-year renewal of its franchise to operate on Springfield street should be considered as a separate proposition. The matter, the Railway Commissioners said, would not enter into the present dispute concerning privileges of the traction company on South Main street.

MISCELLANEOUS

Berkeley's New City Hall Lacks Office Room

Berkeley, Cal.—Even before the new municipal officials get into the new City Hall they find that it is not sufficiently commodious to suit their convenience. The building is large enough, but the two main floors are so cut up with comparatively small rooms that it will be difficult to conduct the business of the city. One peculiar feature of the interior arrangement is the generous width of the hallways. They are spacious enough to accommodate thousands of people marching to the diminutive apartments in which the officers and their deputies are supposed to crowd together in carrying on the city's affairs. Fortunately, there are some extra rooms in the building which may be utilized for the purpose of accommodating the overflow of assistants, and these rooms will relieve the strain that otherwise would come on the more central offices.

Megaphone to Warn Autoists

Cincinnati, O.—Chief Millikin has decided on a new way to warn automobile speeders and other violators of the auto laws when they are infringing on them. He secured a huge megaphone, which will be placed in the hands of a husky "copper," who will be stationed on a prominent corner. When the autoist appears who is violating the law in any way he will be warned by the policeman through the megaphone. If this is not heeded the violator will then be locked up.

Grounds About Railroad Station Improved

Eugene, Ore.—Thanks to the efforts of public-spirited citizens and the Civic Improvement Association, the grounds around the railroad station have been improved. At the west end of Depot Park, as it is called, is an Alpine garden, or rockery. At the west end a rose garden of 400 bushes has been planted. The driveways have been illuminated by arc lights.



Courtesy Evening Telegram, Portland, Ore

ROSE GARDEN, EUGENE, ORE.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Street Railroad Franchise

Village of Phoenix vs. Gannon et al.—Railroad Law provides that fifteen or more persons may incorporate for the purpose of building and operating a railroad or for maintaining a railroad already built, not owned by a railroad corporation, or for both purposes. Section 57 provides that every person or corporation owning, leasing, operating or in possession of a railroad shall make an annual report. Section 81 declares that any mortgagee of the property and franchise of a railroad corporation may purchase it at foreclosure sale. Section 91 of Article 4, relating specially to street surface railroads, contains general provisions indicating an intention to confine the actual operation of such railroads to corporations. Section 92 prescribes the procedure for the construction of a street railroad; but in the section authorizing the granting thereof there is nothing to suggest that it may not be given to an individual. Section 93 provides that in cities of 1,250,000 inhabitants the bidder to whom such a franchise is sold must be a duly incorporated corporation of the State, plainly implying that in other cities and villages there is no such limitation. Held, that a village could grant a valid franchise to an individual for a street railroad in its streets, which franchise could be assigned to a corporation thereafter to be formed to exercise the franchise, and hence a bond given by individual assignees of the person to whom a village had granted such a franchise, conditioned to carry out its terms, was not without consideration.—Court of Appeals of New York; 88 N. E. R., 1066.

Junk Dealers—Reasonableness of Regulations

Grossman et al. vs. City of Indianapolis et al.—Under Acts 1905, authorizing cities to enact ordinances to license and regulate junk dealers, a city enacted an ordinance making it unlawful to engage in the business of junk dealers without a license, and requiring that only one junk store be kept under a single license, and that every junk dealer keep a written record of the things purchased, the price paid therefor, the time of purchasing, and the name, residence, age, color, height, weight, complexion and style of dress and beard, of the seller, and requiring that all goods purchased be retained by the dealer for at least forty-eight hours before reselling, and prohibiting the purchase of goods from an intoxicated person. Held, that the business of junk dealers was peculiarly subject to regulation under the police power, the purpose of the authority to regulate being to prevent petty theft and the concealment of stolen goods, and ordinances enacted thereunder would not be declared invalid unless clearly unreasonable, and that from this standpoint the ordinance was not unreasonable or in restraint of trade.—Supreme Court of Indiana; 88 N. E. R., 945.

Street Improvements—Order of Appraisers

Randolph vs. City of Indianapolis et al.—An order setting aside the report of appraisers appointed to assess benefits on account of certain street improvements is not an ultimate judgment in an independent judicial proceeding, but is an order taken in the exercise of jurisdiction over and as a mere incident to the principal proceeding, which is administrative in its character, and is therefore unappealable.—Supreme Court of Indiana; 88 N. E. R., 949.

Annexation of Territory

City of Pueblo et al. vs. Stanton et al.—Under 3 Mills' Ann. St. Rev. Supp., authorizing the City Counsel to annex by ordinance any tract adjoining any first-class city, but not within its limits, if it has been platted, or whenever any tract is included or embraced within the corporate limits, but has not been made a part of the city, the boundary line of the city must be an unbroken line and separate property within from property without the city at every point, and, when property is excluded from the city limits by its boundary line, it is not "included" or "embraced" within the city within the statute, so as to authorize its annexation, those words being synonymous.—Supreme Court of Colorado; 102 P. R., 512.

Dedication of Public Lands as Highways

City of Butte vs. Mikosowitz.—A dedication of public land for highways under the Revised Statutes, providing that a right of way for the construction of highways over public land is thereby granted, is a grant to the public as a continuing body, so that, so long as the roadway remains a rural one, it is under the supervision of the county as trustee for the public; and as soon as the territory comes within the limits of an incorporated city it passed to the city as trustee for the same public.—Supreme Court of Montana; 102 P. R., 593.

Annexation of Territory—Proceedings

City of Louisville vs. Brown et al.—Where, in a suit under the Kentucky statutes, to prevent the annexation of territory to a city, the allegation of plaintiff that 75 per cent or more of the freeholders in the territory remonstrated was denied, and the burden was on plaintiff to prove that 75 per cent of the freeholders remonstrated, and where he did not do so, he should not be permitted to introduce evidence as to whether the failure to annex the territory would retard the progress of the city and the property owners of the territory.—Court of Appeals of Kentucky; 119 S. W. R., 1196.

Defective Street—Changing Cause of Action

Lyle vs. City of Detroit.—Detroit City Charter 1904 provides that no action shall be brought against the city for any negligent injury, unless written notice of its nature, etc., is given within three months of the time of the injury, etc. Held that, where in an action for personal injuries plaintiff's notice showed that she received a severe shaking up, resulting in a shock to her nervous system, an amendment to the declaration by the addition of the allegation that plaintiff received a severe shock to her nervous system, etc., did not introduce a new cause of action.—Supreme Court of Michigan; 122 N. W. R., 108.

Defective Streets—Construction—Liability

Armstrong vs. City of Auburn.—If a municipal corporation rightfully causes an improvement to be constructed or other work to be done, whether by an independent contractor or otherwise, it is bound to take notice of the character of the work and its condition, whether safe or dangerous, and is bound to take notice of the condition, whether safe or dangerous, of its streets and grounds as affected by the prosecution or performance of such improvement or work.—Supreme Court of Nebraska; 122 N. W. R., 43.

Street Grade—Claim for Damages

Smith vs. City of Spokane.—Under Spokane City Charter, providing that claims for damages to property sustained by reason of the negligence of the city or any officer or employee must be presented to the Council within a specified time, a claim for damages to property abutting on a street, caused by the grading of the street by the city, must be presented as a condition precedent to an action therefor.—Supreme Court of Washington; 102 P. R., 1036.

Annexation of Territory

People ex rel. Scholler vs. City of Long Beach.—Deering's General Laws, providing for the organization of cities under which the city of B. was organized, provide that the County Board of Supervisors shall establish the boundaries which shall remain until by action authorized by law for the annexation of additional territory the boundaries shall be changed. Statutes of 1889 provide a scheme for annexation of territory, and declares that the boundaries of any city may be altered and new territory annexed by proceedings to be had as provided for in the statute. The Constitution, article 11, declares that cities shall not be created by special laws, but that the Legislature by general laws shall provide for the organization of cities, and that all special charters shall be subject to and controlled by general laws. The city of B. attempted to annex territory, but the proceedings were legally ineffectual to accomplish the result, and thereafter the city adopted a charter prepared by a board of freeholders as provided in the Constitution, article 11. Held, that the fact that such charter described the boundaries of the city of B. as including the territory which the city had sought to annex did not accomplish an annexation.—Supreme Court of California; 102 P. R., 664.

Town Treasurer's Compensation

Town of Sheridan vs. Stahl.—Refunding bonds to the amount of \$75,000 were issued by an incorporated town to be sold for cash or exchanged, and the bid of the C. bank for their purchase was accepted, payment to be made when the refunding bonds were delivered, but they were not then issued because of litigation, and plaintiff, the Town Treasurer, forwarded the C. bank a draft to cover accrued interest on the outstanding bonds, directing it to pay the interest only when the bonds were surrendered, and authorizing it to redeem the bonds both as to principal and interest, and the bank forwarded the amount, together with \$75,000, to redeem the principal to a New York bank, directing it to pay the interest and take up the bonds and forward them to it uncanceled, and to forward the interest coupons to plaintiff as canceled, and after \$29,500 of the bonds had been taken up and forwarded to the C. bank, it directed, without plaintiff's knowledge, that the balance of the amount deposited with the New York bank be deposited by it with another bank. Only the amount of bonds named had been taken up when plaintiff's term of office expired, but he learned of the withdrawal of the money by the C. bank and that the bonds were being taken for its account, and, after the expiration of his term of office, the remaining bonds were taken up by the bank and all of them surrendered to the town upon receipt of the refunding bonds. Held, that as plaintiff never received, and was not entitled to, possession during his term of office of the \$75,000 received for the refunding bonds, he could not recover a percentage for receiving and disbursing such money under the town charter, giving the Treasurer a percentage of all money received and disbursed as compensation, and that the bondholders were bound to surrender the bonds only to the town before they were due was immaterial, they having in fact surrendered them to the bank with plaintiff's knowledge.—Supreme Court of Wyoming, 102 P. R., 660.

Ordinance Regulating Use of Streets

Frisbie vs. City of Columbus.—The ordinance of the City of Columbus passed March 20, 1905, to license and regulate the use of the streets of the city by persons who use vehicles thereon, in so far as it applies to motor vehicles, was annulled by the act passed April 2, 1906, and was not revived by the repeal of that act by the act passed May, 9, 1908.—Supreme Court of Ohio, 89 N. E. R., 92.

Bond Election—Double Question

Stern vs. City of Fargo et al.—A resolution adopted by the City Council, providing for an election to vote on the issuance of bonds, and a notice by the City Auditor of such election, which state the purposes of the proposed bond issue to be "to defray the cost of building and constructing a new water works pumping station and installing therein a new high-duty pump and necessary steam boilers, * * * and for the purpose of installing an electric light plant in connection with said pumping station for furnishing street and other lights and power," state two purposes and an election held pursuant to such resolution and notice is illegal, and a majority vote in favor of issuing bonds for the purposes stated does not authorize or empower the City Council to issue them.—Supreme Court of North Dakota, 122 N. W. R., 402.

Closing Streets—Laches

In re Smith.—In 1899 the Park Commissioners of Buffalo obstructed streets crossing a parkway. Persons interested made efforts to remove the obstructions without success, and in 1908 one of them obtained an alternative writ of mandamus requiring the Commissioners to remove the obstructions. Held, that the right to the writ was not barred by laches.—Supreme Court of New York, 118 N. Y. S., 95.

Dedication—Acts Constituting

Rudolph vs. City of Elyton.—Where the owner of land adjoining a road within the city limits caused it to be platted, mapped and laid out in city lots, and sold the lots with reference to the plats, and a subsequent owner had it resurveyed and replatted, and filed the map in the probate office showing the road as a public highway, the road was dedicated to public use, so that one buying lots with reference to such plat cannot question the public character of the highway.—Supreme Court of Alabama, 50 S. R., 80.

Special Assessments—When Due

State ex rel. McCullough vs. City of Seattle.—Seattle City Charter, article 8, section 17, requiring property owners who have paid assessments for local improvements, and who seek a rebate on account of an excess in the fund, to make demand therefor within two years, is valid as a statute of limitations. The word "due," as used in Seattle City Charter, providing that demand must be made by property owners for a rebate from an excess in assessments for local improvements within two years from the date on which the assessments become "due," means the expiration of the period in which the assessments can be paid without added interest; but where the final cost of the improvement is not determinable until its completion, the limitation period does not begin until it is ascertained that there will be an excess.—Supreme Court of Washington, 102 P. R., 770.

Health Regulations—Discharge of Sewage

Miles City vs. Board of Health of State of Montana.—Under Rev. Codes, authorizing a State Board of Health to prohibit the discharge of sewage into a stream if it is detrimental to public health, where the Board of Health prohibits a city from discharging sewage into a river until it purifies the sewage in a manner acceptable to the board, the order is valid, even conceding that the city could acquire a prescriptive right to so discharge its sewage as against the State, as in its police power a State may regulate a lawful right, even if it destroys the right, and the order did not forbid the use of the river, but only that it purify the sewage before discharging it therein.—Supreme Court of Montana, 102 P. R., 695.

Publication of Improvement Notice

Wannenwetsch vs. Mayor, etc., of City of Baltimore.—Under Baltimore City Ordinance providing for the publication of notice of an application for street improvement, for ten days, in at least two daily newspapers, published in Baltimore, publication of a notice in two newspapers, one of which was in the German language, was insufficient.—Court of Appeals of Maryland, 73 A. R., 700.

Regulating Hours of Work

Byars vs. State.—It is within the power of a State, as guardian and trustee for its people and having full control of its affairs, to prescribe the conditions upon which it will permit public work to be done on behalf of itself, its counties, cities or other municipalities. In the exercise of these powers it may by statute provide that eight hours shall constitute a day's work for all laborers employed by or on behalf of the State or any of its municipalities, and make it unlawful for any one thereafter contracting to do any public work to require or permit any laborer to work longer than eight hours per day, and require such contractors to pay the current rate of daily wages.—Criminal Court of Appeals of Oklahoma, 102 P. R., 804.

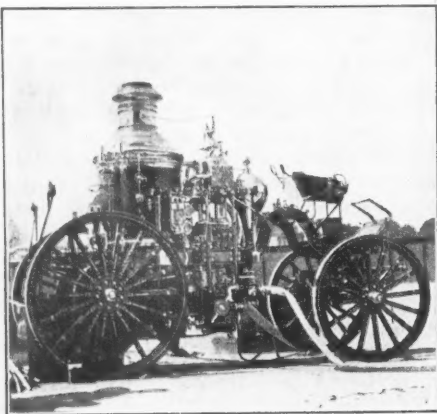
Improvements—Lien—Enforcement

City of Chehalis vs. Cory et al.—A city charter provided that preliminary to the making of any street improvement the Council should estimate the cost, that a copy of the resolution should be published, that a time should be fixed for protests, that in case of protests by a certain proportion of owners no improvement should be made unless a certain number of members of the Council should vote for it, that the expenses should become a lien, and that in an action to enforce the lien a recovery should be permitted to the extent of the proper proportion of the value of the work or material which would be chargeable on such lot or land, notwithstanding any informalities, irregularities or defects in any of the proceedings. Held, that the fact that the contract for an improvement called for twice the amount of the estimate was no bar to a foreclosure of the lien, as the property owners, if misled by the estimate, might be entitled to have their assessments reduced "to the extent of the proper proportion of the value of the work," and the failure to make an accurate estimate was a mere defect in the proceedings, and not such a fraud on the property owners as to invalidate the proceedings, though it might, perhaps, entitle them to a reduction of the assessment.—Supreme Court of Washington, 102 P. R., 1027.

NEWS OF THE SOCIETIES

Calendar of Meetings

- August 31-September 2.
Association of Edison Illuminating Companies.—Annual meeting, Briarcliff Manor, N. Y.—D. L. Huntington, Secretary, Spokane, Wash.
- September 1-3.
League of Third-Class Cities of Pennsylvania.—Annual convention, New Castle, Pa.—Mayor D. M. Johnson, Secretary, Chester, Pa.
- September 7-10.
Pacific Coast Association of Fire Chiefs.—Convention, Seattle, Wash.—W. H. Bringham, Secretary, Seattle, Wash.
- September 8-10.
New England Water Works Association.—Annual convention, New York City.—Willard Kent, Secretary, Narragansett Pier, R. I.
- September 9.
New Jersey State Firemen's Association.—Convention, Atlantic City, N. J.—William Exall, Secretary, 86 Bruce street, Newark, N. J.
- September 9.
New Jersey Patrolmen's Benevolent Association.—Convention, Paterson, N. J.—Henry W. Weller, President, Newark, N. J.
- September 14-16.
International Association of Municipal Electricians.—Annual convention, Atlantic City, N. J.—F. P. Foster, Secretary, Corning, N. Y.
- September 14-17.
Michigan Gas Association.—Annual meeting, Detroit, Mich.—A. P. Ewing, Secretary, Detroit, Mich.
- September 15-17.
Massachusetts State Firemen's Association.—Convention, Plymouth, Mass.—D. Arthur Burt, Secretary, Taunton, Mass.
- September 29.
New Hampshire State Firemen's Association.—Convention, Woodsville, N. H.—George L. Osgood, Secretary, Concord, N. H.
- September 29-30.
Ohio Fire Chiefs' Association.—Convention, Alliance, O.—D. K. Mosher, Secretary, Warren, O.
- October 4-8.
American Street and Interurban Railway Association.—Annual convention, Denver, Col.—B. S. Swenson, Secretary, 29 W. 39th St., New York, N. Y.
- October 7.
League of Virginia Municipalities.—Fourth annual meeting, Staunton.—J. Davis Reed, Portsmouth, President; L. C. Brinson, Portsmouth, Secretary.
- October 19-22.
American Public Health Association.—Annual convention, Richmond, Va.—Charles O. Probst, Secretary, Columbus, O.
- October 20.
American Gas Institute.—Annual meeting, Detroit, Mich.—A. B. Beadle, Secretary, 29 W. 39th St., New York, N. Y.
- November 3.
Lakes-to-Gulf Deep Waterway Convention.—Convention, New Orleans, La.
- November 9-11.
American Society of Municipal Improvements.—Annual convention, Little Rock, Ark.—A. Prescott Folwell, Secretary, 241 W. 39th St., New York, N. Y.
- November 15-19.
National Municipal League.—Annual meeting, Cincinnati, O.—Clinton Rogers Woodruff, Secretary, 705 North American Building, Philadelphia, Pa.



SECOND SIZE METROPOLITAN ENGINE
American-La France Company



EXHIBIT AT GRAND RAPIDS CONVENTION

FIRE APPARATUS

Exhibited at Grand Rapids Convention
—Official Tests—Account of Exhibits

The following official report of tests of fire apparatus exhibited at the Thirty-seventh Annual Convention of the International Association of Fire Engineers was made by the committee appointed by President Filmore Tyson:

TEST NO. 1—Samuel Eastman Company exhibited a four-way Jumbo deluge set connected by four 50-ft. lines of 2½-in. hose to a single hydrant under 90 pounds pressure. Excellent streams were played successively from three different-size nozzles, viz: 2¼-in., 2½-in. and 2¾-in., throwing from 1,220 to 1,650 gallons of water per minute, which was very satisfactory.

TEST NO. 2—Andrew J. Morse & Son, Inc., exhibited a wagon pipe—the smallest size made by this firm—with 1½-in. and 1¾-in. nozzles. Smooth streams carrying 565 gallons and 715 gallons, respectively, were played. Three short slamed lines of hose were connected to a single hydrant under 90 pounds pressure. The work of this apparatus was satisfactory.

TEST NO. 3—Play Pipe Pressure Controller Co. exhibited the Glazier playpipe pressure controller, a device tended to reduce the back kick or recoil on a nozzle when a heavy stream is flowing. It was tested by measuring the recoil with spring scales both with and without the controller. The figures, which were roughly taken, failed to show any reduction in recoil beyond what might be expected from the reduced discharge caused by the obstruction in the pipe.

TEST NO. 4—C. W. O'Neill, Chicago, exhibited the O'Neill basement pipe. Two styles of cellar pipe, one with a smooth nozzle and one with a spray nozzle, were exhibited and worked successfully under ordinary engine pressure.

TEST NO. 5—The Pyrene Company, New York, exhibited the Pyrene fire extinguisher. A satisfactory demonstration was given of the ability of Pyrene to extinguish fires in gasoline-soaked waste as well as burning gasoline in a receptacle.

TEST NO. 6—American-La France Fire Engine Company exhibited a second-size Metropolitan engine, which was operated at draft with a 12-ft. lift from the river. Three brief runs were made, each lasting about three minutes, viz:

First Run—Two streams, each through 250 ft. of 2½-in. hose and a 1½-in. ring nozzle. Best pressure at engine, 192 lbs.; best pressure at nozzles, 127 lbs.; discharge, 631 gallons per minute.

Second Run—Two streams, through 250-ft. lines of 2½-in. hose slamed into a 1½-in. Eastman deluge nozzle. Best pressure at engine, 200 lbs.; best pressure at the nozzle, 113 lbs.; discharge, 710 gallons per minute.

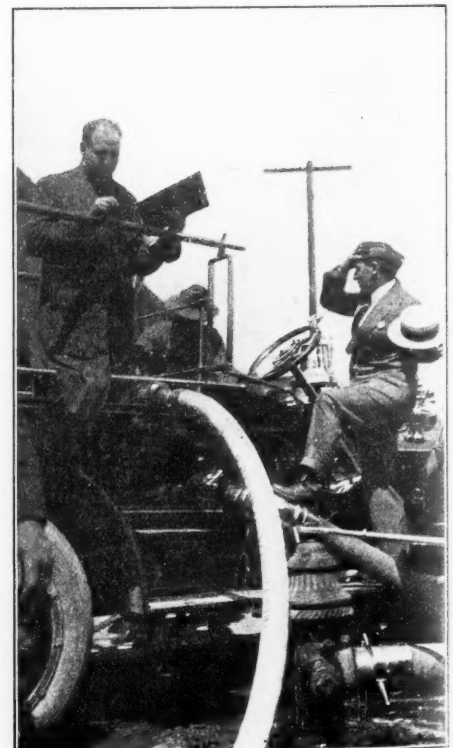
Third Run—One stream through 500 ft. of 2½-in. hose with a 1½-in. ring nozzle.

Best pressure at engine, 310 lbs.; best pressure at the nozzle, 139 lbs.; discharge, 333 gallons per minute.

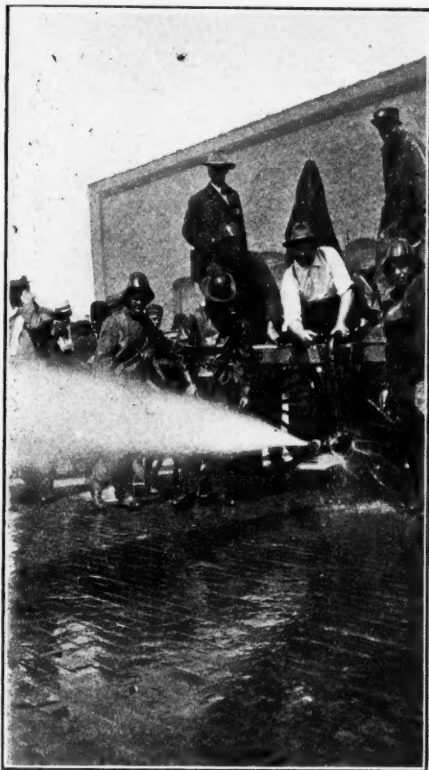
This test was very satisfactory.

TEST NO. 7—The American-La France Fire Engine Company also exhibited a 75-ft. automatic aerial ladder truck. The main ladder was raised twice automatically, each time in five seconds. The tip was extended by two men in 12.1-5 seconds more, making the total time for raising and extending 17.1-5 seconds. The ladder was swung in all directions while elevated at various angles. This test was very satisfactory.

TEST NO. 8—The Webb Motor Fire Apparatus Company exhibited a 90-hp., six-cylinder, gasoline automobile fire engine. The engine, with a load of hose and seven passengers, ran a distance of 2¾ miles, connected to a hydrant and played water through 150 ft. of 2½-in. hose with 1¼-in. nozzles in 6 minutes and 32 seconds. The running time for the 2¾ miles, which included slowing down for eight turns, was



TESTING WEBB AUTO ENGINE



O'NEILL BASEMENT PIPE

5 minutes and 31 seconds, or an average speed of 30 miles per hour.

The engine was given five pumping trials, viz:

First Run—One line 150 ft. $2\frac{1}{2}$ -in. hose with $1\frac{1}{4}$ -in. nozzle. Pressure at engine, 188 lbs.; pressure on suction, 56 lbs.; pressure at nozzle, 84 lbs.; discharge, 422 gallons per minute.

Second Run—Two streams, each through 150 ft. of $2\frac{1}{2}$ -in. hose, with $1\frac{1}{4}$ -in. smooth bore nozzles. Pressure at engine, 158 lbs.; pressure on suction, 48 lbs.; pressure on nozzles, 72 and 75 lbs., respectively; discharge, 640 gallons per minute.

Third Run—Two 150-ft. lines of $2\frac{1}{2}$ -in. hose siamesed into a large $1\frac{1}{2}$ -in. deluge nozzle. Pressure at engine, 158 lbs.; pressure on suction, 44 lbs.; pressure at nozzle, 82 lbs.; discharge, 614 gallons per minute.

Fourth Run—Two 150-ft. lines of $2\frac{1}{2}$ -in.

hose siamesed into a scant $1\frac{3}{4}$ -in. deluge nozzle. Pressure at engine, 146 lbs.; pressure on suction, 46 lbs.; pressure at nozzle, 62 lbs.; discharge, 702 gallons per minute.

Fifth Run—One 700-ft. line of $2\frac{1}{2}$ -in. hose with $1\frac{1}{4}$ -in. smooth nozzle. Pressure at engine, 194 lbs.; pressure on suction, 56 lbs.; discharge, about 280 gallons per minute. The gasoline supply was exhausted before the nozzle pressure could be measured on this run.

These tests were very satisfactory.

TEST NO. 9—Curtis Fire Stream Gauge, exhibited by Capt. Greely S. Curtis, New York. This gauge was used for the purpose of measuring the streams of water shown in foregoing tests and seemed to be very satisfactory.

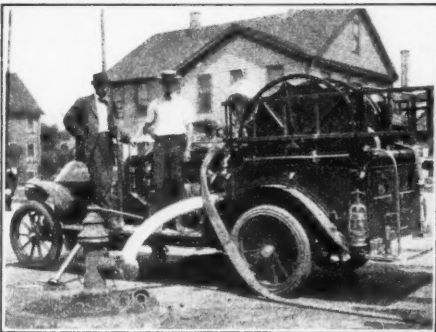
TEST NO. 10—The American Motor Fire Apparatus Company exhibited a 115-hp., six-cylinder, gasoline automobile fire engine. Three runs were made.

First Run—Two lines of 150 ft. each of $2\frac{1}{2}$ -in. hose with 1-in. nozzles. Pressure at engine, 88 lbs.; pressure at suction, 65 lbs.; pressure at nozzles, 56 and 55 lbs., respectively; discharge, 480 gallons per minute.

Second Run—Two 150-ft. lines of $2\frac{1}{2}$ -in. hose siamesed to one 50-ft. length of $2\frac{1}{2}$ -in. hose with $1\frac{1}{4}$ -in. nozzle. Pressure at engine, 102 lbs.; pressure at suction, 66 lbs.; pressure at nozzle, 44 lbs.; discharge, 462 gallons per minute.

Third Run—One 350-ft. line of $2\frac{1}{2}$ -in. hose with $1\frac{1}{4}$ -in. nozzle. Pressure at engine, 150 lbs.; pressure on suction, 67 lbs.; pressure at nozzle, 39 lbs.; discharge, 290 gallons per minute.

The exhibits of the various companies manufacturing fire department supplies were shown at Bronson's garage. They were as follows:



AMERICAN MOTOR FIRE APPARATUS CO.'S ENGINE

Webb Motor Fire Apparatus Company, Vincennes, Ind.—Four machines: One 900-gallon auto pump engine and one combination auto wagon made for the city of Trenton, N. J.; two 700-gallon auto pump engines, one made for Augusta, Ga., and the other for Rockford, Ill. The following representatives of the company were present: J. Napier Dyer, General Manager; A. C. Webb, Vice-president; R. B. Reynolds, General Sales Agent; C. O. Pingrey, Neodesha, Kan.; D. H. Woodhouse, New York, N. Y., and Delivery Engineers E. Stires, P. Stires and H. H. Ripley.

American-La France Company, Elmira, N. Y.—One second-size Metropolitan engine, a combination wagon, a complete 75-ft. aerial truck and a demonstrating truck. C. J. Cross, General Sales Manager; E. Sands, General Superintendent; Agents: E. C. Keating, New York, N. Y.; O. S. Doolittle, Chicago, Ill.; S. H. Mitchell, Boston, Mass.; Jos. Thomas and E. Schmitz were in attendance.

Gamewell Fire Alarm Telegraph Company, New York, N. Y.—Fire alarm telegraph system, consisting of non-interfering succession fire alarm boxes, punching registers, combined gongs and indicators, fire alarm repeaters, storage battery and controlling switchboard. Representing the company were Wm. Gellaly, General Manager; Frank C. Stover, Sr.; Frank C. Stover, Jr.; E. A. Jaffrey; O. P. Crocker and F. M. Clements.

The Vinton Company, New York, N. Y.—The Peerless automatic head protector, intended as a complete protection from smoke or fumes.

Anderson Coupling and Fire Supply Co., Kansas City, Mo.—A Camp hose coupling. Represented by G. A. Anderson.

S. F. Bowser & Co., Fort Wayne, Ind.—Long distance gasoline storage tank and pump; portable wheel tank, intended to deliver gasoline from storage tanks to automobile without danger or loss; lubricating tanks with barrel hoist; the Bow-



AMERICAN LA FRANCE AERIAL TRUCK

ser dry cleaning system, for handling benzine, gasoline and naphtha from storage tanks to stills, washers, etc., without loss, danger, etc. J. M. Runyan and S. P. Walker were present.

C. A. Brophy, Hinsdale, Ill.—Uniform buttons and badges.

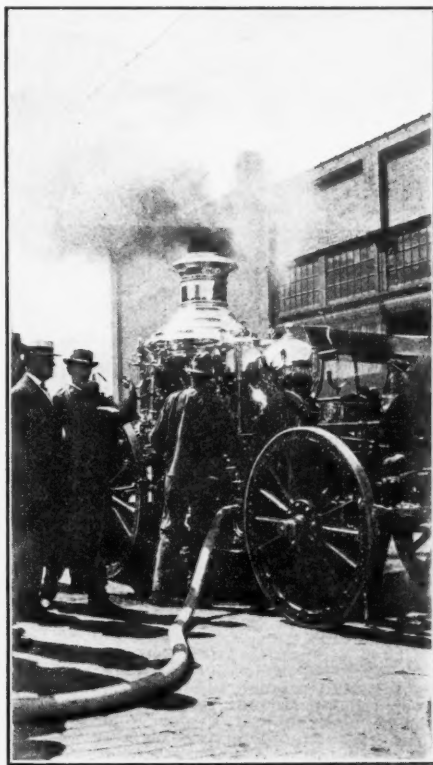
Bundy, Morrison & Pinsoneault, Watertown, N. Y. A special door opener and shutter with an electrical trip. Mr. Morrison is chief of the Watertown department.

Robert Carleton Company, Boston, Mass.—Ceiling springs, harness hangers, stall door hinges, breast collar locks, harness snaps and standard harness and collars.—O. M. Carleton was present.

The Cory-Patterson Manufacturing Company, Greenfield, O.—Browder life saving machine. N. P. Clayburn and William Helfrich were present.



TESTING MORSE WAGON PIPE



AHRENS ENGINE, TWO YEARS OLD

G. F. Davis, Utica, N. Y.—Automatic safety fire escape, by the use of which it is claimed one can lower any weight from 25 pounds to 500 pounds or more, that it can be used by any one without previous knowledge, and by use of which one can lower three people per minute indefinitely; safe for women and children.

Samuel Eastman & Co., Concord, N. H.—Eastman nozzle holder and equipment. Represented by C. P. Robinson.

Firestone Tire and Rubber Company, Akron, O.—A very complete and satisfactory exhibit of rubber tires. The company was represented by G. A. Talbott and A. P. Cleveland. They presented every chief present with a \$2,500 accident insurance in the North American Insurance Company.

J. P. Flanagan, Milwaukee, Wis.—The Flanagan automatic fire alarm signal in card system.

The Fire and Gas Appliance Company, Kansas City, Mo.—A device for turning off the gas in a building from the outside in case of fire. This can be done either automatically or by hand. The company was represented by L. E. Wyne, Henry Sieben and C. H. Pointdexter.

Globe Manufacturing Company, Pittsfield, N. H.—Globe suits, rubber boots and



EXHIBIT OF FIRESTONE TIRE CO.

Represented by M. D. Larkin, D. C. Larkin, R. E. White and John Buckley.

Ivert Larsen, Chicago, Ill.—The Armstrong adjustable collars and hames and breast collar lock.

Library Bureau, Chicago, Ill.—Complete model of the running book fire alarm system. Represented by F. R. Kelly.

Fred. Morrison, Watertown, N. Y.—Automatic door opener and closer, with time lock attachment.

Andrew J. Morse & Son, Boston, Mass.—Wagon and fireboat pipe, which was demonstrated by Edw. W. Sibley.

Milwaukee Specialty Manufacturing Company, Milwaukee, Wis.—An oats cleaner and salt feeder for feeding loose salt. Represented by W. M. Quirk.

New Departure Manufacturing Company, Bristol Conn.—Chief's buggy bells and ball-bearing fire apparatus bells. Represented by M. J. Horton.

Sackett Plaster Board Company, New York, N. Y.—Plaster board, intended as a substitute for inflammable wooden lath.

Henry Sieben, Kansas City, Mo.—A very complete and satisfactory automatic and manual turn off and on gas valve. Also a chemical fire nozzle.

John Simmons Company, New York, N. Y.—Seagrave hydrant cut-off valve. Represented by J. V. Forster.

Sheldon Axle Company, Wilkes-Barre, Pa.—Empire ball-bearing anti-friction axles. Represented by D. F. Carmody.

The A. P. Smith Manufacturing Company, Newark, N. J.—The Smith patent tapping machine, intended for the purpose

of installing fire hydrants to water mains without shutting off water supply.

J. E. Smith, Portland, Me.—Combination life belt, hose carrier, etc.

Star Electric Company, Binghamton, N. Y.—Fire alarm system, consisting of street boxes, combination gong and indicator, mechanical striking gong, registers, and Proctor board. Represented by M. E. Barrett, R. C. Baker, J. C. Husman and E. J. Morley.

Thos. J. Sullivan, Detroit, Mich.—Hose holder which seemed to be a very complete outfit.

Swinehart Clincher Tire and Rubber Company, Akron, O.—Tires for motor trucks, flange clincher rims for motor wagons, wheel and tire for steamer or aerial truck. Represented by B. C. Swinehart and M. S. Iles.

Tea Tray Company, Newark, N. J.—Large and small chemical tanks. This company manufactures complete wagon equipment, either horse-drawn or automobile. Represented by Clement Beecroft, Sales Manager, and Walter K. Harland.

The United States Fire Protection Company, Utica, N. Y.—Automatic fire escape.

H. W. Van Meter, Grand Rapids, Mich.—Van Meter smoke protector.

Walsh Safety Lock Snap Company, Grand Rapids, Mich.—Self-locking harness snaps.

J. A. Weider, Rochester, N. Y.—Fire and ambulance collar.

Woodhouse Manufacturing Company, New York, N. Y.—Vulcan fire engine torches, Dewey hose coupling expander, and Woodhouse fire boat nozzles.



STREAM FROM METROPOLITAN ENGINE

a line of fire department supplies. Represented by C. L. Roby.

The Goodyear Tire Company, Akron, O.—Rubber tires.

H. Hallahan, New York—Rubber horse-shoe pads. Represented by E. D. Thorne.

Henderson & Haldeman, Kansas City, Mo.—The Kansas City lath hook, a combination hook and ladder in one.

Geo. C. Hale, Kansas City, Mo.—Hale swinging harness, halter strap, door opener, cellar pipe, electric wire cutter, tin roof cutter, nozzle, breast collar lock, bits, rein trace and pole snaps, and spanners. Represented by M. H. Bottom.

R. Hanish & Sons, Chicago, Ill.—The Hanish swing harness, Kennedy automatic harness holder, and the O'Neill deluge basement pipe. Represented by R. Hanish and F. W. Dauterich.

S. F. Hayward Company, New York, N. Y.—Life nets, deluge nozzles, automatic jacks for taking the weight off tires and friction brakes. This company is also the eastern agents of the Howe Engine Company of Indianapolis, manufacturers of automobile fire apparatus. Represented by A. R. Brown.

Larkin Manufacturing Company, Dayton, O.—Nozzles, valves, playpipes, hydrant gates, and rubber goods, as well as fire department supplies of every description. They also showed a new hydraulic expander and hose testing machine, to automatically attach couplings to chemical hose, fire hose, suction hose, etc., taking care of any size coupling. This is a new device.



EXHIBIT AT GRAND RAPIDS CONVENTION

New England Water Works.—The twenty-eighth annual convention of the association will be held at the Park Avenue Hotel, New York, N. Y., September 8-10. The programme arranged is as follows:

Tuesday, September 7

Reception in the parlors of the Park Avenue Hotel.

Wednesday, September 8

Morning, 9:30—Address of Welcome, Business meeting. Paper: "The New York Water Supply," by William W. Brush, Engineer of Distribution, New York City. Paper: "Odors and Tastes in the Water Supply of Holyoke," by James L. Tighe, City Engineer, Holyoke, Mass. Report of Committee, "To prepare a Standard Specification for Fire Hydrants,"—H. O. Lacount, George A. Stacy, Frank A. McInnis, Frederick W. Gow, William F. Sullivan, Committee.

Afternoon and Evening

Trip to Coney Island.

Thursday, September 9

Morning, 9:30—Report of the Committee "To look after and keep track of Legislation and other matters pertaining to the Conservation, Development, and Utilization of the Natural Resources of the Country,"—M. N. Baker, William T. Sedgwick, Leonard Metcalf, Allen Hazen, George A. Soper, Committee. Paper: "The Poughkeepsie Water Works," by Dr. John C. Otis, Poughkeepsie, N. Y. Paper: "Water Works Accounting," by Harvey S. Chase, Boston, Mass.

Afternoon—Visit to the Pennsylvania Railroad terminal and trip through the tunnels of the Manhattan & Hudson Railway Company from 28th street to Hoboken, Jersey City, Cortlandt street, New York, and return.

Evening—Report of Committee, "To collect data relating to awards that have been made for damages resulting from the diversion of water; also to consider the practicability of joint action with the National Cotton Manufacturers' Association, or other organization of mill owners, leading to the formation of standard rules and methods of computing or assessing damages for the diversion of water,"—Charles T. Main, Leonard Metcalf, Richard A. Hale, Charles E. Chandler, William Wheeler, Committee. Report of Committee, "To compile information relating to awards that have been made in Water Works Valuation Cases,"—Francis W. Dean, John C. Chase, Committee. Paper: "Disinfection as an adjunct to Water Purification," by H. W. Clark, Chemist, Mass. State Board of Health, Boston, and Stephen De M. Gage, Biologist, Mass. State Board of Health, Boston. Paper: "Camaguey (Cuba) Water Works," by Henry A. Young, C.E., Yonkers, N. Y.

Friday, September 10

There will be a trip to the Ashokan Reservoir of the Catskill Water Supply System which is now under construction by the City of New York. The railroad companies have quoted a round trip rate from New York to Brown's Station, where the work is located, of \$3.22 for 100 persons or more traveling together. In case this number can be obtained, special cars on the West Shore Railroad will be furnished, leaving West 42d St. Ferry at 8:35 a. m., reaching Kingston, N. Y., at 11:02, and proceeding thence by a special train on the Ulster & Delaware Railroad. Brown's Station will be reached at 11:45 a. m. Lunch will be served on arrival of the train and will be at the expense of the resident members. Returning, the train will leave Brown's Station at 4:30 p. m., making connection with the West Shore Limited at Kingston and arriving at New York at 8 p. m. Definite arrangements for this trip will be announced later.

Ample accommodation for the exhibits of associate members will be provided at the hotel. Information relating thereto may be obtained of, and application for space made to, F. N. Whitcomb, with A. P. Smith Manufacturing Company, Newark, N. J. The committee of arrangements is composed of the following members: George S. Rice, Rudolph Hering, Allen Hazen, E. L. Peene, George W. Batchelder, George A. King is in charge of transportation. Robert J. Thomas is president, and Willard Kent, secretary.

League of American Municipalities.

—The thirteenth annual convention was held at Montreal, Canada, August 25-27. At the opening President Silas Cook, East St. Louis, Ill., read a letter expressing the regret of Mayor Payette, Montreal, that illness prevented him from attending the convention. Alderman G. W. Sadler welcomed the convention. He said that Montreal had a low tax rate in spite of its large debt. The rate is one cent on real estate, five mills for schools and a seven and a half per cent business tax on rentals. The city pays the whole cost of pavements. He expressed surprise at the rates of 2 and 2.5 per cent prevailing in some American cities. President Cook emphasized the growing importance of city government, saying that before many years half the population would be city dwellers. He said that the first step toward improved city conditions is to take the public into the government's confidence. He thought that the statements made in James Bryce's work on the "American Commonwealth" regarding the bad character of municipal government had done much to discourage good men from accepting city office. Secretary John MacVicar, one of the commissioners of Des Moines, Ia., reviewed the work of the league since its organization in 1897. The greatest work now in hand, he said, was home rule for cities. Laws designed to make city government honest and efficient really made it impossible in many instances to conduct city business in an intelligent manner. Robert Brennan, City Attorney, Des Moines, speaking of the control of public utilities, declared that a national organization existed for the purpose of securing indeterminate franchises in cities without the consent of the city concerned. Mr. Brennan spoke of the bill introduced in the last Iowa Legislature to create a State board, with the powers of the Railway Commission. He objected to this because the members were not to be residents of cities. He thought the object of the bill was to take the control of public utilities away from the cities. He maintained the argument of the legislators for control of rates was merely an effort to hide the real issue—the attainment of indeterminate franchises without municipal consent. J. Barry Mahool, Mayor of Baltimore, Md., said the people of his city were in favor of a public service commission, but he emphasized the need of protecting civic home rule. He suggested that the commissioners might be appointed by the Governor in consultation with the Mayors, instead of by the Legislature. Harry P. Nichols, engineer, Bureau of Franchises, New York City, was called on by President Cook to explain the status of the Public Service Commission of New York. He said the chief opposition to the commission arose out of its power to collect the larger part of its cost of maintenance, amounting to about \$1,000,000 a year, from the city, against its will. He said that New York had home rule in regard to franchises except in certain regards to rapid transit underground. A New York delegate, unnamed, who said he had a brother on the commission, said that the commission was free from politics and that any citizen who had a complaint to make could have it investigated. Comptroller Betts, St. Paul, Minn., expressed the belief that all cities should own street car lines, railways, sewer pipes, gas pipes and every other structure supplying public service

and lease them to companies. In Europe, he said, there was a class of men who, on having amassed a fortune, retired from business and took an active part in city affairs. R. F. Maddox, Atlanta, Ga., spoke of the effects of prohibition in his city, saying that conditions had improved, and that the city had suffered no financial injury from the loss of revenue from liquor licenses. A. C. Pleydell, secretary of the New York Tax Reform Association, read a scholarly paper on the subject of taxes. He said no country, or city either, can continue to be prosperous if the taxes collected from the people exceed the value to them of government expenditures. Real estate values are almost an automatic guide to the wisdom or folly of municipal improvements. If streets and paving and lighting are extended with a fair measure of foresight and common sense, the increased values will appear at once and the taxes will come in with which to finance the projects. W. Robb, City Treasurer, Montreal, discussed the ethics of taxation. The matter of special taxes was taken up by the league. Mayor Roland D. Haven, Duluth, advocated a special tax on automobiles on the ground that they wore out the roads faster than any other vehicles. Encroachments on streets, such as outside stairways and overhanging windows were productive of revenue to the holder, and hence should be subject to a special tax. He condemned the tendency of Legislatures to place all public utilities on a gross revenue basis, so that their entire tax payments go into the State Treasury. Delegate Herron, Milwaukee, Wis., said his city was about to introduce a vehicle tax and wanted to know what other cities had done. Figures were given him from Baltimore, Kansas City and St. Louis. City Treasurer Robb, Montreal, suggested that the limitation of exemptions from taxation be limited to an area twice or thrice that occupied by buildings to the land, with a proviso that where land is sold it should be held liable for the payment of taxes during the exempt period. Mayor Grant Conrad, San Diego, Cal., told of what had been accomplished in his city in 100 days under commission government. Mr. David Heineman, Mayor of Detroit, formerly vice-president of the league, was unanimously elected president of the American League of Municipalities. The other officers are: First vice-president, John R. Cronin, of Joliet, Ill.; Second vice-president, Alderman L. A. Lapointe; third vice-president, Miller F. Funkhouser, of Omaha, Neb.; fourth vice-president, W. M. O'Brien, of Owensboro, Ky.; secretary-treasurer, Hon. John MacVicar, of Des Moines. Trustees: W. J. Honey, of Fort Wayne, Ind.; W. H. Emerson, of Winnipeg; Fred. Busse, of Chicago; Jerome Congleton, of Newark, N. J.; Harry S. Cooper, of Baltimore; T. E. Knox, of Garry, Ind.; Grant Conrad, of San Diego. The next place of meeting will be St. Paul.

Western Pennsylvania Firemen's Association.—At the Beaver Falls convention the following officers were elected: President, P. J. Kelly, Glassport; vice-presidents, Samuel Cunningham, North Braddock; Nicholas Link, Mount Oliver; W. H. C. Smith, Homestead; secretary, William H. Sharrah, Braddock; treasurer, James H. Steel, Wilkinsburg; delegate to State Convention, Louis Schmertz, East McKeesport; alternate to State Convention, Charles Engle, McKees Rocks.

Association of State and National Food and Dairy Departments.—At the convention at Denver, Col., August 26, President Roosevelt's famous Remsen Referee Board of Consulting Scientific Experts was endorsed. After a fight in which the term "medicated garbage" was used, the association approved of the use of benzoate of soda as a food preservative by the following resolution, adopted by a vote of 57 to 42: "That this association endorses the report of the Referee Board of Consulting Scientific Experts appointed by Secretary of Agriculture Wilson at the direction of President Roosevelt, upon the use of benzoate of soda in food products." The delegation from the United States Department of Agriculture voted "yes." Secretary Wilson was an attentive spectator, but was not a delegate. A committee headed by Dr. Floyd W. Robinson, of Lansing, Mich., which had been appointed to "investigate" the Remsen Board, previously had reported adversely to the Board's findings, declaring benzoate promoted "the practice of concealing unsanitary methods," and calling upon President Taft to institute another investigation on "broader lines." The debate began following addresses by Dr. Ira Remsen, of Baltimore; Dr. Russell H. Chittenden, of New Haven, Conn.; Dr. John H. Long, of Evanston, Ill., and Dr. Christian H. Berter, of New York, who, as members of the Referee Board, told how their experiments had been made upon "18 healthy young men" at Chicago, New York and New Haven, which brought them to the conclusion that the chemical, when administered in small quantities in the daily diet, was harmless. Dr. Remsen told of the formation of the Board, which later was given his name, and said it was asked to determine two points, whether benzoate of soda in quantities as are likely to be used is or is not injurious to health, and whether the quality or strength of a food to which benzoate of soda has been added is thereby reduced, lowered or injuriously affected. "You know the conclusions to which the Board has been led by its work," he concluded. "With the actual experimenting I had nothing to do." Dr. Chittenden told the convention that three-tenths of a gram was administered daily to each of six subjects for two months. In a one-month experiment each man received per day during the first week a gram a day, the second week two grams a day, the third week three grams a day, and four grams a day the fourth week. "From our experiments," he said, "only one logical conclusion seems possible, viz.: That benzoate in small and large doses up to four grams per day is without deleterious effect upon the human system. I believe the evidence warrants the opinion that sodium benzoate is no more harmful than corresponding amount of salt."

Virginia State Firemen's Association.—At the convention, Hampton, Va., August 25-27, the following officers were elected: President, J. R. N. Curtin, Alexandria; senior vice-president, Capt. J. W. B. Crooks, Richmond; statistician, J. E. Glenn, Harrisonburg; secretary, George G. Cumming, Portsmouth; treasurer, E. J. Williams, Charlottesville; chairman legislative committee, J. H. Redwood, Richmond. The convention decided to meet next year at Alexandria. About 1,500 firemen were in attendance on the convention. President W. J. Weymouth of the Hampton company calling the body to

order. Mayor Thornton F. Jones delivered the address of welcome and turned the keys of the city over to the visitors. Only 176 of the visitors were accredited delegates to the convention, and a majority of the 1,500 spent their time seeing the sights on the peninsula. Every city and many of the towns of the State were represented by delegations.

Wisconsin State Firemen's Association.—At the Madison convention the following officers were elected: President, John J. Hennessey, Milwaukee; vice-president, H. A. Eiserman, Kenosha; secretary, Ole Norman, Superior; treasurer, J. H. Kratz, Manitowoc. The new president appointed the following committees: Legislative—L. Honlon, Milwaukee; D. E. Desmond, La Crosse; A. H. Thayer, Ashland; Ethan Allen, Superior; J. Conroy, Appleton; Edward Lynch, Milwaukee, and W. F. Hartnett, Racine. Executive—Olaf Johnson, Superior; John Winstanley, Oshkosh, and Edward Redford, Sheboygan. Topic—T. A. Clancy, Milwaukee; Owen Sullivan, Hurlay; W. E. Herron, Eau Claire. La Crosse was selected as the city for the 1910 convention.

New York State Volunteer Firemen's Association.—At the convention, Poughkeepsie, N. Y., August 18, the following officers were elected: President, John L. Kyne, East Syracuse; first vice-president, Fred A. Davis, Fort Edward; second vice-president, William B. Carpenter, Flushing; secretary, Thomas Honohan, Frankfort; treasurer, John P. Powers, Ossining. Trustees Firemen's Home at Hudson: Judge Joseph E. Eggleston, Cortland; Jacob Shoemaker, Buffalo; Ernest H. Seehusen, New Brighton; John Patterson, New York. Member executive committee, Sanford W. Smith, Chatham.

Michigan Electrical Association.—The following officers were elected at the Detroit convention: President, A. S. Marshall, Port Huron; vice-president, George Westover, Cadillac; secretary-treasurer, J. A. Cleveland. The executive committee is composed of A. S. Marshall, Port Huron; A. S. Williams, Grand Rapids; R. W. Hemphill, Ann Arbor; A. Parshall, Jackson; O. S. Wood, Ionia; William Loudon, Traverse City. The financial committee is William Chandler, Sault Ste. Marie; H. Fee, Adrian, and W. P. Hetherington, Belding.

National Association of Cement Users.—This association has decided to hold its sixth annual convention in Chicago on February 21-24, these dates being covered by the third annual cement show. This show will be held in the Coliseum, February 18 to 26, this having been adopted instead of the 17th to the 23d, as previously announced.

PERSONALS

BROCKBANK, H. G., Wakefield, Mass., Chief of Police, has resigned.

BURBRIDGE, BENJAMIN, Jacksonville, Fla., has been elected a member of a Board of Bond Trustees, succeeding Judge William B. Young, resigned.

BUSSE, FREDERICK A., Mayor of Chicago, Ill., has appointed the following committee of eleven members to investigate Chicago's municipal expenses: Alderman Charles E. Merrian, Professor of Political Science, University of Chicago; Alderman Bernard W. Snow, Chairman Council Finance Committee; Alderman Nicholas R. Finn, Walter H. Wilson,

City Controller; Frank I. Bennett, member Board of Education, formerly Chairman Council Finance Committee; A. C. Bartlett, of the Commercial Club; George G. Tunell, Statistician of the Santa Fé Railroad; Walter L. Fisher, Special Traction Council of the city; William A. Tilden, President of the Fort Dearborn National Bank, and John W. Alvord, civil engineer.

CAMPELL, N. DEMAREST, Assistant Chief of the Fire Department of Hackensack, N. J., for ten years, has been elected Chief of the Department over F. L. Brykczynski.

CAMPEN, GEORGE, Omaha, Neb., recently appointed Assistant City Engineer, was City Engineer of Lincoln for several years and recently has been connected with the municipal engineering works of the Canal Zone.

COLCORD, ELIHU W., Lawrence, Mass., formerly City Treasurer, died Aug. 23.

CORIELL, A. S., has been appointed Assistant to the City Surveyor of Elizabeth, N. J., in connection with the intercepting sewer work.

CROWLEY, PATRICK, Lake Charles, La., formerly Mayor, died August 21.

DOBSON, GEORGE D., former City Engineer of Des Moines, Ia., who has recently been engaged on private irrigation work in Wyoming, has returned to Des Moines to open an office as consulting engineer. He will continue, however, to supervise the work he has been engaged upon in Wyoming. His Des Moines address is the Hawkeye Building.

EWELL, WALTER W., Superintendent of the Water Works Department of Quincy, Mass., during 1908, and for three years Commissioner of Public Works, died on August 22.

FAYMONVILLE, BERNARD, President of the Board of Fire Commissioners of San Francisco, Cal., has tendered his resignation to Mayor Taylor on account of ill health and pressure of private business.

HENDRICK, CALVIN W., Chief Engineer of the Baltimore Sewer Commission, recently returned from an inspection visit to the Panama Canal.

HERRMANN, "GARRY," Cincinnati, O., President of the National Baseball Commission, has been appointed Director of the Department of Public Safety by Mayor Leopold Markbreit at \$8,000 per annum; during the recent illness of Mayor Markbreit the office was given to Robert Laidlaw by Vice-Mayor John Galvin, and he will now have to relinquish it.

KERR, JOHN H., Perth Amboy, N. J., has been appointed Deputy Health Collector.

PICKARD, WALTER, Durham, N. C., Chief of the Chapel Hill Fire Department, died August 21.

RICKER, EDW. P., Poland, Me.; James M. McNulty, Bangor, and E. C. Jordan, Portland, have been appointed by Governor Fernald members of the State Water Storage Commission.

WATTENGEL, LOUIS J., North Tonawanda, N. Y., Chief of Fire Department, died August 22.

WHITLOCK, BRAND, Toledo, O., has been nominated for a third term at the head of a full ticket for city officers by the Independents. Mr. Whitlock is the political successor of the late Golden Rule Mayor Samuel M. Jones, out of whose campaign grew the independent voters' movement in Toledo. The question of 3-cent street car fare will be the leading issue of the campaign.

WALLACE, J. M., Danville, Ky., has been elected Mayor, to succeed H. E. Woolfolk, resigned.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals

It is our purpose to give in the first issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article; except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles, where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS

Good Roads and Highway Engineering. By A. W. Campbell. 4 pp., Western Municipal News, August. 10 cts.

Pavements Demanded at the Present Time by Urban and Interurban Roads. Paper before Engineering Association of the South. By H. L. Collier. 50 pp., Proceedings of the Engineering Association of the South, June. \$1.

King's Highway. 2-3 p., Contract Journal, July 21. 20 cts.

Roads and Pavements. By T. H. Macdonald, C. P. Chase and J. O. Schultze. 9 pp., Proceedings Iowa Engineering Society, 1909. 50 cts.

Location and Design, Theory of Economic Road and Street. 1 p., Engineering-Contracting, July 28. 10 cts.

Cost of Constructing Macadam Roads in Missouri. 11-2 pp., Engineering-Contracting, Aug. 4. 10 cts.

Dust Preventing Materials on Roads. Metropolitan Paving Committee's Investigation. 2 pp., Surveyor, July 23. 20 cts.

Dust Suppression on Boston's Parkways. By J. A. Pettigrew. 1 p., Western Municipal News, August. 10 cts.

Tar Spraying Machine, Automobile. Illustrated. 1-2 p., Engineering Record, Aug. 14. 10 cts.

Tar and Its Uses as a Dust Palliative. By John Robinson. 1-3 p., Local Government Journal, July 24. 1-3 p., July 31. 10 cts.

Bituminous Material for Road Surfaces. From paper before American Society for Testing Materials. By Clifford Richardson. 12-3 pp., Engineering Record, Aug. 14. 10 cts.

Testing Bituminous Materials, Improved Instruments for. Paper before American Society for Testing Materials. By Herbert Abraham. Illustrated. 4 pp., Good Roads Magazine, August. 10 cts.

Methods of Examination of Bituminous Materials for Road Construction. Paper before American Society for Testing Materials. By Clifford Richardson and C. M. Forest. 13-4 pp., Canadian Engineer, July 30. 15 cts.

Road Materials and Some Simple Rules for Testing Them. Paper before First Congress of Road Builders. By A. B. Fletcher. 21-3 pp., Engineering Record, July 31. 10 cts.

Effect of Free Carbon in Tars. Paper before American Society for Testing Materials. By Provost Hubbard. 41-2 pp., Good Roads, August. 10 cts.

Bituminous Paving in Chicago. Satisfactory work of last season. Modifications of methods this year. Cost. 12-3 pp., Municipal Journal and Engineer, Aug. 25. 10 cts.

Tar-Macadam. Paper before Wisconsin Gas Association. By J. D. Taylor, Jr., 1 p., Progressive Age, Aug. 2. 10 cts.

Tar-Cap Macadam. Paper before Engineering Association of the South. By M. Nicholson. 11 pp., Proceedings of the Engineering Association of the South, June. \$1.

Tarmac Road Construction. Paper before Good Roads Congress. By E. F. Hooley. 2-3 p., Engineering-Contracting, July 28. 10 cts.

Asphalt Macadam Roadways. Paper before Good Roads Congress. By Clifford Richardson. 1 p., Canadian Engineer, Aug. 13. 15 cts.; 2-3 p., Engineering-Contracting, July 28. 10 cts.

Oiled Reinforced Cement Macadam Pavement. By E. J. Walker. Illustrated. 4 pp., Pacific Municipalities, July. 10 cts.

Asphalt Paving, Progress in. By H. Tipper. 11-4 pp., Good Roads, August. 10 cts.

Highway Maintenance and the Missouri Law for County Engineers. Paper before Illinois Society of Engineers and Surveyors. By Will. Dowell. Illustrated. 1 p., Engineering News, July 29. 15 cts.

Construction and Care of Earth Roads. By Hiram Donkin. Illustrated. 3 pp., Contract Record, Aug. 4; 31-2 pp., Aug. 11. 10 cts.

Comments on Making Wagon Road Ditches and on Back Filling Trenches. 12-3 pp., Engineering-Contracting, July 28. 10 cts.

Street Repair Department of Baltimore. Work of the. 11-3 pp., Engineering-Contracting, Aug. 18. 10 cts.

Extraordinary Traffic on Highways, Contractors and. 11-2 pp., Contract Journal, July 21. 20 cts.

Influence of Large Auto-Omnibuses Upon Highways. 1-3 p., Engineering Record, Aug. 7. 10 cts.

Vitrified Brick Roadway. By W. P. Blair. Illustrated. 2 pp., Clay-Worker, July. 25 cts.

Tests of Paving Brick. From bulletin of Illinois State Geological Survey. By A. N. Talbot. Illustrated. 2 pp., Municipal Engineering, August. 25 cts.

Creosoted Wood Block Street Paving. Paper before First American Congress of Road Builders. By Andrew Rinker. 1 p., Good Roads, August. 10 cts.

Cost of Laying Creosoted Wood Block Paving in Minneapolis. 1-3 p., Engineering-Contracting, Aug. 18. 10 cts.

Artificial Stone for Footways. Paper before Institution of County and Municipal Engineers. Illustrated. 3 pp., Surveyor, Aug. 6. 20 cts.

SEWERAGE AND SANITATION

Sewer Construction in St. Louis. Cost-Keeping Methods on. Illustrated. 11-2 pp., Engineering Record, July 31. 10 cts.

Sewer Tunnelling in London. Illustrated. 21-2 pp., Engineering Record, Aug. 14. 10 cts.

Difficult Sewer and Street Work on Reclaimed Land. Illustrated. 1-3 p., Engineering Record, Aug. 14. 10 cts.

Sewer Pipe Specifications. Report of Committee of the American Society for Testing Materials. 1 p., Municipal Journal and Engineer, Aug. 18. 10 cts.

Concrete Sewer Pipe as Made and Laid in Brooklyn. 3 pp., Concrete, August. 15 cts.

Kutter's Formula, Graphic Solution of. Illustrated. 1 p., Engineering-Contracting, July 28. 10 cts.

Sewage Pumping in Lynn. 1-4 p., Municipal Journal and Engineer, Aug. 18. 10 cts.

Sewers and Sewage Pumping at Grand Rapids. Construction details. Illustrated. 71-2 pp., Municipal Journal and Engineer, Aug. 11. 10 cts.

Chicago Drainage Canal, Early History of the, and Present Day Justification for Sewage Disposal by Dilution. Communication from Rudolph Hering. 1-3 p., Engineering News, Aug. 12. 15 cts.

North Shore Channel of the Sanitary District of Chicago. Illustrated. 2 pp., Engineering-Contracting, Aug. 4. 10 cts.

Sewer Connections. 1-3 pp., Municipal Journal and Engineer, Aug. 18. 10 cts.

Pollution of Streams. 22-3 pp., Engineering Record, Aug. 7. 10 cts.

Sewer Air, Bacteria in. Paper before National Association of Master Plumbers. By C. E. A. Winslow. 21-2 pp., Canadian Engineer, Aug. 20. 15 cts. 2 pp., The Surveyor, Aug. 6. 20 cts.

Sewage Treatment, Modern. By L. W. Hignett. 2-3 p., Contract Journal, July 28. 20 cts.

Status of Sewage Disposal in America. By Alexander Potter. Illustrated. 6 pp., Municipal Engineering, August. 25 cts.

Sewage Purification vs. Water Filtration. Paper before American Society of Municipal Improvements. By G. C. Whipple. 2 pp., Canadian Engineer, July 30. 15 cts.

Fashions in Sewage Disposal. 1 p., Contract Journal, Aug. 21. 20 cts.

Principles Involved in the Purification of Sewage. Paper before Institution of Municipal Engineers. By L. W. Hignett. 1 p., Surveyor, Aug. 6. 20 cts.

Sewage Disposal, Role of Bacteria and Oxygen. Illustrated. 11-2 pp., Canadian Engineer, Aug. 13. 15 cts.

Disposal of Sewage and Town Refuse. Paper before Bombay Medical Congress. By H. W. Maxwell. 4 pp., Indian Public Health, July. 25 cts.

Report on Sewage Disposal Plants. By the Council's Sewerage Committee of Trenton, N. J. Illustrated. 51-2 pp., Municipal Journal and Engineer, Aug. 25. 10 cts.

Sewerage and Sewage Disposal Works at

Ruislip-Northwood. By W. L. Carr. 31-2 pp., The Surveyor, July 30. 20 cts.

Raising "Cricket Bat Willows," Peppermint, and Other Crops on the Sewage Disposal Area of Sutton, Surrey, England. From paper before Association of Managers of Sewage Disposal Works. 1-2 p., Engineering News, Aug. 12. 15 cts.

Sewage Disposal. Land intermittent filtration. 21-2 pp., Canadian Engineer, Aug. 20. 15 cts.

Sewage Disposal. Removal of putrescibility. Illustrated. 2 pp., Canadian Engineer, Aug. 6. 15 cts.

Preliminary Processes of Sewage Disposal. Paper before Health Congress. By A. J. Martin. 3-4 p., Contract Journal, July 28. 20 cts. Arena, August. 25 cts.

Sewage Contact Filters with Automatic Control at Auburn. Illustrated. 21-2 pp., Engineering Record, Aug. 21. 10 cts.

Aerating and Flushing System for Percolating Sewage Filter. By W. G. Taylor. Illustrated. 21-2 pp., Engineering News, Aug. 19. 15 cts.

Treatment of Storm Water. Paper before Health Congress. By G. A. Hart. 2-3 p., Contract Journal, July 28. 20 cts.

Hampton Doctrine vs. Dunbar. By Dr. A. Lübbert. 3 pp., Canadian Engineer, Aug. 13. 15 cts. 21-2 pp., Surveyor, July 23. 20 cts.

Travis Hydrolytic Tanks at Norwich, England. Paper before Royal Sanitary Institute. By A. E. Collins. 2 pp., Engineering Record, Aug. 21. 10 cts.

New Method of Treating Sewage. Description of Emscher Method. By K. Imhoff. 21-2 pp., Engineering Digest, August. 20 cts.

Disinfection of Sewage and Sewage Filter Effluents. From Water Supply Paper U. S. Geological Survey. By E. B. Phelps. 31-2 pp., Engineering-Contracting, Aug. 11. 10 cts.

Practical Sterilization of Water and of Sewage Effluents. Paper before Institute of Municipal Engineers. By H. C. H. Shenton. 7 pp., Indian Public Health, July. 25 cts.

Public Health in its Appeal to the People. Bulletin North Carolina Board of Health, July. 10 cts.

Divided Responsibility in regard to Public Health. Paper before Saskatchewan Medical Association. By Dr. C. A. Hodgetts. 3 pp., Canadian Engineer, Aug. 6. 15 cts.

Health Congress at Leeds. Abstract of papers. 3 pp., Contract Journal, Aug. 4. 20 cts.

Typhoid Epidemics. By Hilder Daw. 11-2 pp., Canadian Engineer, July 30. 15 cts.

An Outbreak of Typhoid Fever Due to Milk. By E. G. Smith. Fire & Water, Aug. 4. 10 cts.

Hookworm Disease and Its Relation to the Negro. By C. W. Stiles. 6 pp., Public Health Reports, July 30.

Sanitary Science and the Problems of Congested Urban Life. Presidential address before Leeds Congress. By T. W. Harding. 14 pp., Journal of the Royal Institute of Public Health, August. 60 cts.

Food Products, Use of Benzoate of Soda in. By H. E. Barnard. 11-2 pp., Bulletin Indiana Board of Health, June. 10 cts.

WATER SUPPLY

Water Works of Gary, Ind. Construction details. Illustrated. 6 pp., Municipal Journal and Engineer, Aug. 18. 10 cts.

Battle Creek Water Works. 1 p., Municipal Journal and Engineer, Aug. 25. 10 cts.

Carlisle Water Supply. Illustrated. 11-3 pp., Municipal Journal and Engineer, Aug. 6. 15 cts.

Houston Water Supply and Works. Illustrated. 7 pp., Progressive Houston, August. 10 cts.

Early History of the St. Louis Water Works. 11-3 pp., Water and Gas, August. 20 cts.

Water Supply of Charleston. By E. P. Verner. 2 pp., Fire and Water, July 28. 10 cts.

Water Supplies. Paper before Bombay

Medical Congress. By K. E. Dadachanji. 6 pp., Indian Public Health, July. 25 cts.
Leeds Health Congress. Review of papers on water supply. 11-2 pp., Surveyor, Aug. 6; 1 p., Aug. 13. 20 cts.

Yield of Water, Rainfall, etc., on a Moorland Watershed, and Notes on the New High Level Water Works of Exmouth. Paper before County and Municipal Engineers. 2 pp., Contract Journal, July 21. 20 cts.

Artesian Prediction, Geological Basis for. By N. H. Darton. Illustrated, 11-3 pp., Fire and Water, Aug. 4. 10 cts.

Reservoirs, Water Losses in. 1-3 p., Municipal Journal and Engineer, Aug. 18. 10 cts.

Earth Dams. By Frank Reed. Illustrated. 11-2 pp., Canadian Engineer, Aug. 13. 15 cts.

Some Observations on the Stability of Dams. Paper before Western Society of Engineers. By J. F. Jackson. Illustrated, 11-2 pp., Engineering News, July 29. 15 cts.

Stand-pipe, Present Condition of the Attleboro Concrete. Illustrated, 2-3 p., Engineering News, Aug. 19. 15 cts.

Distribution Systems, a Problem in the Economic Design of Water. By Rudolph Hering. Illustrated, 3-4 p., Engineering News, Aug. 12. 15 cts.

Pipe Laying in New England Cities, Cost of. 2-3 p., Engineering-Contracting, July 28. 10 cts.

Cost of Laying Main Water Pipe in Boston. Illustrated, 11-2 pp., Engineering-Contracting, Aug. 18. 10 cts.

Coatings and Coverings for the Prevention of Soil and Electrolytic Corrosion of Iron Pipe, Comparative Values of Various. Paper before Illinois Gas Association. By R. B. Harper. Illustrated. 2 pp., American Gas Light Journal, Aug. 9; 4 pp., Aug. 16; 6 pp., Aug. 23. 10 cts.

Electrolysis at Winnipeg. 11-3 pp., Engineering Record, Aug. 7. 10 cts.

Corrosion of Metals Underground by Electrolysis. By A. A. Knudson. Illustrated, 20 pp., Journal of the Franklin Institute, August. 10 cts.

Flow of Water in Pipes, Culverts and Channels. By E. H. Essex. 1 p., Surveyor, July 30. Illustrated, 1 p., Aug. 13. 20 cts.
Contract Journal, July 28. 20 cts.

Gauge Measurements of Service Connections of the Ancient Roman Water Works. Paper before Engineers Club of St. Louis. By M. L. Halman. 6 pp., Journal Association of Engineering Societies, June. 30 cts.

Easement Curves for Hydraulic Machinery and Pipes. Condensed from paper in "The Engineer." Curves for reducing friction. By Robert H. Smith. 2 pp., Engineering Digest, August. 20 cts.

Pitot Tube, Ratings of a. By E. C. Murphy. Illustrated, 11-3 pp., Engineering News, Aug. 12. 15 cts.

Steel Conduit at Little Falls, N. J. By F. C. Perkins. Illustrated, 3-4 p., Fire and Water, Aug. 4. 10 cts.

Construction Plant Employed on the New York Water Supply. By H. P. Kleffer. Illustrated, 4 pp., Municipal Engineering, August. 25 cts.

Submerged Pipe Laying at Fort Greble. Illustrated, 1-2 p., Fire and Water, Aug. 4. 10 cts.

Progress of the Southwest Water Tunnel in Chicago. Illustrated, 31-3 pp., Engineering Record, Aug. 7. 10 cts.

Pumping Engine, Test of Lowell. 11-2 pp., Fire and Water, July 28. 10 cts.

Producer Gas Pumping Engines. 1-2 p., Municipal Journal and Engineer, Aug. 4. 10 cts.

Sloux City's Pumps Flooded. 1-4 p., Municipal Journal and Engineer, Aug. 25. 10 cts.

Purchase of Coal by Heat Units. Paper before American Water Works Association. By E. W. Bemis. Midland Municipalities, August. 10 cts.

Heat Value Specifications for Coal. 11-2 pp., Electric Railway Journal, July 31. 10 cts.

Waste Water Survey at Chicago. By T. C. Phillips. 1 p., Fire and Water, Aug. 4. 10 cts.

Analysis of Some Fairmount Park Waters. By Martha Tracy. Illustrated, 3 pp., Journal of Franklin Institute, August. 50 cts.

Purification of Water by Ozone. By S. Rideal. 2 pp., Fire and Water, July 28. 10 cts.

Operating Results and Costs, Torresdale Filtration Plant. Illustrated, 12-3 pp., Engineering Record, July 31. 10 cts.

Notes on Certain Points in the Design of Large Filtration Plants. Paper before Engineers' Club of St. Louis. By S. B. Kussell. 14 pp., Journal Association of Engineering Societies, June. 30 cts. 21-2 pp., Engineering-Contracting, Aug. 18. 10 cts.

Preliminary Chemical Treatment as an Aid to Slow Sand Filtration. Indianapolis Water Co. Paper before American Chemical Society. By H. E. Jordan. Illustrated,

21-2 pp., Engineering News, Aug. 5. 15 cts.

Sterilization of Boonton Reservoir Water. Paper before American Water Works Association. By G. W. Fuller. 5 pp., Municipal Engineering, August. 25 cts.

Water Softening for Purification and Its Saving. Paper before American Water Works Association. By M. Miller. 5 pp., Municipal Engineering, August. 25 cts.

Value of Water. By A. D. Adams. 3 pp., Municipal Engineering, August. 25 cts.

Water Works Appraisements in Missouri and Kansas. By C. S. Burns. 1 p., Engineering News, July 29. 15 cts.

Liabilities of Water Companies for Fire Losses. Paper before American Water Works Association. By C. K. McFarland. 4 pp., Municipal Engineering, August. 25 cts.

Water-Rate Litigation at Oakland, Cal., Nine Years of. 2-3 p., Engineering News, Aug. 12. 15 cts.

Philadelphia Water Works, Proposed Lease of. 11-2 pp., Water and Gas, August. 20 cts.

Would Lease Philadelphia Water Works. 3 pp., Public Service, August. 20 cts.

The Recent Broadside on the Proposed Lease of the Philadelphia Water Works to the Municipal Improvement Co. 11-2 pp., Engineering News, Aug. 12. 15 cts.

Operating and Cost Records of Philadelphia Water Bureau. 2-3 p., Engineering Record, Aug. 7. 10 cts.

STREET LIGHTING AND ELECTRIC POWER

Street Illumination. 1-2 p., Municipal Journal and Engineer, Aug. 4. 10 cts.

Street Lighting in Mishawaka, Ind. Illustrated, 1-3 p., Municipal Journal and Engineer, Aug. 11. 10 cts.

Street Lighting in Washington. 1-4 p., Municipal Journal and Engineer, Aug. 11. 10 cts.

Lighting of Public Streets in European Cities. 11-2 pp., Architect and Contract Reporter, July 30. 20 cts.

Illumination of Market Street, Newark. Illustrated, 2 pp., Illuminating Engineer, August. 20 cts.

Public Lighting. 1 p., Municipal Journal, July 23. 15 cts.

Factors to be Considered in Making Street Lighting Contracts. Paper before Ohio Electric Light Association. By Samuel Rust. 1 p., Electrical World, July 29. 10 cts.

Distance Control of Gas Street Lighting in England. By J. A. Seager. 1 p., Surveyor, Aug. 6. 20 cts. Illustrated, 4 pp., Illuminating Engineer, August. 20 cts.

Park Lighting at Oklahoma City. Illustrated, 3-4 p., Electrical Review, July 31. 10 cts.

Illumination, Science in. Paper before National Electric Light Association. By G. A. Sawin. 2 pp., Public Service, August. 20 cts.

Light Unit, International. 1-4 p., Municipal Journal and Engineer, Aug. 25. 10 cts.

Standards of Electric Service in the State of Wisconsin. 11-2 pp., American Gas Light Journal, Aug. 2. 10 cts.

Municipal Lighting Plant at Jacksonville, Fla. By B. H. Clinger. Illustrated, 11-2 pp., Electrical World, Aug. 5. 10 cts.

Newark's Municipal Light Plant. 1-2 p., Municipal Journal and Engineer, Aug. 25. 10 cts.

Tungsten Lighting in Mishawaka, Special. Illustrated, 1 p., Electrical Review, Aug. 7. 10 cts.

Electric Meters in Baltimore, Testing. 2-3 p., Municipal Journal and Engineer, Aug. 18. 10 cts.

Gas vs. Electricity for Lighting. By E. N. Wrightington. 3 pp., Light, August. 20 cts.

The Gas Meter. Paper before Iowa District Gas Association. By R. H. Lawlor. 21-2 pp., Progressive Age, Aug. 16. 20 cts.

Electrolysis Lawsuit, Peoria. 2-3 p., Engineering News, Aug. 19. 15 cts.

Conduits, All Concrete Wire. Illustrated, 3 pp., Cement, July 20 cts.

Construction of Telephone Conduits. By C. E. Reakes. Illustrated, 1 p., Canadian Municipal Journal, August. 15 cts.

Power Plants, Connecticut River. Illustrated, 5 pp., Worcester Magazine, August. 15 cts.

Design and Requirements of Electric Power Works. Paper before Institution of Municipal Engineers. By Horace Root. Illustrated, 2 pp., Contract Journal, Aug. 11. 20 cts.

Centralization of Power Supply. Presidential Address Before American Institute of Electrical Engineers. By L. A. Ferguson. 6 pp., Proceedings of the American Institute of Electrical Engineers, August. \$1. 11-3 pp., Engineering Record, Aug. 14. 10 cts.

Gas Profits and Rate Relief. 1 p., Municipal Journal, July 30. 10 cts.

FIRE AND POLICE

Fire Departments, Town. By W. H. Johnson. 5 pp., Insurance Engineering, August. 25 cts.

Louisville Fire Department, Force and apparatus. Repair shop. Cost records. Monthly reports from each company. Rewards. Illustrated, 21-2 pp., Municipal Journal and Engineer, Aug. 4. 25 cts.

Fire Department of Lansing, Mich. Illustrated, 21-2 pp., Municipal Journal and Engineer, Aug. 4. 25 cts.

Training Tower, Denver Fire Department. Illustrated, 1 p., Fire and Water, Aug. 11. 10 cts.

Historical Sketch of the Grand Rapids Fire Department. Illustrated, 2 pp., Fire and Water, Aug. 11. 10 cts.

Fire Equipment and Fire Alarms. Data concerning these from fifty cities. Amount of equipment and lengths of hose per thousand population. Details of fire alarm boxes. 2 pp., Municipal Journal and Engineer, Aug. 4. 25 cts.

Automobile Fire Apparatus. From paper before Minnesota State Firemen's Association. By Capt. J. P. Barrett. Experiences in Vancouver, Springfield and Minneapolis. 1-2 p., Municipal Journal and Engineer, Aug. 4. 25 cts.

Trenton's Experience with Auto Apparatus. 1-4 p., Municipal Journal and Engineer, Aug. 4. 25 cts.

German Automobile Fire Equipment. By F. C. Perkins. Illustrated, 1-2 p., Fire and Water, Aug. 11. 10 cts.

Automobiles for Municipal Service. Forty cities in which fire apparatus is used. Nineteen where there are auto police cars and others in miscellaneous service. Descriptions of cars. Economy and efficiency. Illustrated, 5 pp., Municipal Journal and Engineer, Aug. 4. 25 cts.

Automobiles for Municipal Service. 1-4 p., Municipal Journal and Engineer, Aug. 4. 25 cts.

Fire Fighting, Modern Methods of. By W. T. Beggin. Paper before Central New York Volunteer Firemen's Association. 1 p., Fire and Water, Aug. 11. 10 cts.

Fire and Fire Brigades. By T. E. V. Kirtlan. 1 p., Municipal Journal, Aug. 6. 15 cts.

Automatic Sprinklers, Alleged Failures of. Illustrated, 15 pp., Insurance Engineering, August. 25 cts.

High Pressure System for Chicago. Synopsis of Report submitted by City Engineer Ericson. Data concerning high pressure systems in other cities. Alternative methods of pumping and costs. Illustrated, 61-2 pp., Municipal Journal and Engineer, Aug. 4. 25 cts.

Fire Hazards, Report on Louisville. 2-3 p., Fire and Water, July 28. 10 cts.

Fire Conditions in Kansas City. By J. C. Egner. 2-3 p., Fire and Water, Aug. 18. 10 cts.

Electric Lights and Fires. 2-3 p., Fireman's Herald, Aug. 14. 5 cts.

Fire Loss, Prevention of. By F. W. Fitzpatrick. 2-3 p., Fire and Water, Aug. 11. 10 cts.

Firemen Perform Other Duties. 1-4 p., Municipal Journal and Engineer, Aug. 4. 25 cts.

Hydrant Water in St. Paul, Free. 1-3 p., Municipal Journal and Engineer, Aug. 4. 25 cts.

Police Departments, Automobiles for. From paper before International Association of Chiefs of Police. By J. H. Haager. Illustrated, 1 p., Municipal Journal and Engineer, Aug. 4. 25 cts.

GOVERNMENT AND FINANCE

Commission Rule, Danger in. 1-2 p., Manufacturers Record, Aug. 12. 10 cts.

Municipal Trading in Ireland. 1 p., Municipal Journal, Aug. 6. 15 cts.

Franchise Ideas, New. 11-2 pp., Public Service, August. 20 cts.

Public Utility Legislation, Massachusetts. 1 p., Electrical World, Aug. 5. 10 cts.

Supervision of Street Railways in England and Prussia. 1-3 p., Electrical Review, Aug. 14. 10 cts.

Corporation Publicity in Portland. 1-3 p., Municipal Journal and Engineer, Aug. 11. 10 cts.

Responsible for Streets, Cities. Duties and obligations of municipalities. Under what conditions liable for accidents. Responsible for acts of other parties. By H. C. Lake. 11-2 pp., Municipal Journal and Engineer, Aug. 11. 10 cts.

Non-Expert Reports. 1-2 p., Municipal Journal and Engineer, Aug. 25. 10 cts.

Muck-Rake, a Misdirected. 1-2 p., Literary Digest, Aug. 14. 10 cts.

Assessments for City Improvements. Benefit conferred not always necessary basis of assessment. 1-2 p., Municipal Journal and Engineer, Aug. 11. 10 cts.

Suggestions on Assessment and Taxation. By J. B. Freck. 13-4 p., Canadian Municipal World, August. 10 cts.

Accounts, New York City's Revision of. By H. D. Force. 8 pp., Journal of Accountancy, July. 25 cts.

Depreciation. Paper before Wisconsin Gas Association. By E. S. Mack. 3 pp., Public Service, August. 20 cts.

Going Value and Methods for its Computation. Notes on. Paper before American Water Works Association. By J. W. Alvord. Illustrated, 6 pp., Engineering-Contracting, Aug. 4. 10 cts.

STRUCTURAL MATERIALS

Cement, the Le Chatelier Test for Soundness of Portland. From paper before Institution of Civil Engineers. By A. C. Davis. 11-2 pp., Engineering Record, Aug. 14. 10 cts.

Concrete, Tests on the Effect of Temperature on the Setting of. Illustrated, 1-3 pp., Engineering News, Aug. 12. 15 cts.

Tests of Bond of Steel Bars Embedded in Concrete. Paper before American Society for Testing Materials. By H. C. Berry. Illustrated, 1 p., Engineering-Contracting, Aug. 4. 10 cts.

Reinforced Concrete, Progress Report of Joint Committee on Concrete and. 10 pp., Cement Age, August. 15 cts.

Experiments on Electrolysis in Reinforced Concrete. Paper before Engineers' Club of St. Louis. By A. S. Langsdorf. Illustrated, 11-2 pp., Canadian Engineer, Aug. 20. 15 cts.

Ability of Reinforced Concrete to Sustain Great Elongation. 4 pp., Cement, July. 20 cts.

Constructing a Reinforced Concrete Arch Street Bridge in Baltimore. 11-3 pp., Engineering-Contracting, Aug. 4. 10 cts.

Brick vs. Cement in Manistee. By J. E. Craig. 3-4 p., Brick, August. 10 cts.

Crushing Tests of Brick and Terra Cotta Piers at Illinois Engineering Experiment Station. 11-3 pp., Engineering News, Aug. 12. 15 cts.

Beams, Tests of Standard Wide-Flange. From paper before the American Society for Testing Materials. By Edgar Marburg. Illustrated, 4 pp., Engineering News, Aug. 12. 15 cts.

Tests of Standard and Bethlehem Beams. Illustrated, 11-3 pp., Engineering Record, Aug. 14. 10 cts.

Timber, Standard Specifications for Grading Structural. Report to the American Society for Testing Materials. 12-3 pp., Engineering Record, Aug. 7. 10 cts.

Testing of Materials, Notes Regarding the. By W. G. Karkaldy. Paper before County and Municipal Engineers. 11-2 pp., Contract Journal, July 21. 20 cts. 2 pp., Surveyor, July 30. 20 cts.

BRIDGES

Bridge Design and Maintenance, Stray Thoughts on. Paper before Connecticut Society of Civil Engineers. By H. C. Kelth. Engineering News, July 29. 15 cts. 2pp., Engineering-Contracting, Aug. 4. 10 cts.

An English Double-Deck Swing Bridge for Railway and Roadside Traffic. Illustrated, 31-2 pp., Engineering News, Aug. 19. 15 cts.

A 259-Foot Concrete Arch Bridge in Switzerland. Illustrated, 21-2 pp., Engineering News, Aug. 5. 15 cts.

Construction of Edmondson Avenue Bridge, Baltimore. Illustrated, 4 pp., Engineering Record, Aug. 14. 10 cts.

Methods of Building Bridge at Baltimore. Illustrated, 2 pp., Contractor, Aug. 15. 20 cts.

Erection of Additional Girders, Williamsburg Bridge Towers. Illustrated, 11-2 pp., Engineering Record, Aug. 21. 10 cts.

Progress on the Manhattan Bridge. Illustrated, 3 pp., Engineering Record, July 31. 10 cts.

Street Crossing Foot Bridge at Ferry Terminal, New York. 1-2 p., Engineering Record, Aug. 14. 10 cts.

MISCELLANEOUS

Subways Under Sydney Harbor, New South Wales, Three. By C. O. Burge. Illustrated, 11-2 pp., Engineering Record, Aug. 21. 10 cts.

Supplementary Report on the Proposed Subway System for Street Cars and Elevated Railway Trains in Chicago. Illustrated, 1 p., Engineering News, Aug. 19. 15 cts.

Elevated Railroad, Philadelphia, Trenton Avenue. Illustrated, 21-3 pp., Engineering Record, Aug. 7. 10 cts.

Chicago Track Elevation of Burlington Railroad. Illustrated, 2-3 pp., Engineering Record, Aug. 21. 10 cts.

Trolley Cars in Europe, Trackless. 1 p., Electric Railway Journal, Aug. 21. 10 cts.

Motor Vehicles in England. 1-2 p., Municipal Journal and Engineer, Aug. 4. 10 cts.

Excess Speed Alarm for Motor Vehicles. 1-4 p., Municipal Journal and Engineer, August 4. 10 cts.

City Waste Destructor, Bids for. Choice between two general methods. Engineering expert should be employed. Clear and explicit specifications to be enforced. By F. W. Morse. 11-2 pp., Municipal Journal and Engineer, Aug. 18. 10 cts.

Garbage Removal Monopolies. By John Simpson. 11-2 pp., Municipal Journal and Engineer, Aug. 25. 10 cts.

Garbage Destruction by Incinerator. By T. H. Whitelaw. Illustrated, 1 p., Canadian Engineer, July 30. 15 cts.

Refuse Disposal at Gainesborough. Illustrated, 3 pp., Surveyor, Aug. 13. 20 cts.

Nuisance Grounds and Scavenging System for Villages. 2 pp., Western Municipal News, August. 10 cts.

Smoke Prevention or Smoke Consumption. By H. B. Coes. Illustrated, 11 pp., Engineering Magazine, August. 25 cts.

Legal Aspect of Smoke Abatement. Paper before International Association for the Prevention of Smoke. By B. R. Cobb. 11-2 pp., Power, Aug. 3. 5 cts.

Bricklaying, High Record in, Attained by Novel Methods. By L. W. Peck. Illustrated, 2 pp., Engineering News, Aug. 5. 15 cts.

Crushing Stone, Cost of, by City of Boston. 21-2 pp., Engineering-Contracting, Aug. 11. 10 cts.

Trenches, Comments on Shoring. Illustrated, 2 pp., Engineering-Contracting, Aug. 4. 10 cts.

Comments on Handling Clay in Trenching and Back Filling. 2-3 p., Engineering-Contracting, Aug. 11. 10 cts.

Shovels, Design of, with Comments on Relative Merits of Short and Long Handle Shovels. Illustrated, 1 p., Engineering-Contracting, Aug. 18. 10 cts.

Day Labor and Contract System, An English Comparison of the. 2-3 p., Engineering-Contracting, July 28. 10 cts.

Compressed Air, Production and Use. Paper before Transvaal Institute of Mechanical Engineers. By A. C. Whitome. Illustrated, 31-2 pp., Canadian Engineer, Aug. 13. 15 cts.

Dangerous Structures, Notes on. Paper before Institution of County and Municipal Engineers. By E. Willis. Illustrated, 3 pp., Surveyor, July 23. 20 cts.

Building Code, New York. 10 pp., Cement Age, August. 15 cts.

British Building Legislation, Formation of New Streets. By Horace Cubitt. 11-3 pp., Contract Journal, Aug. 11. 20 cts.

Graphical Computation. By E. P. Goodrich. Illustrated, 1 p., Engineering Record, Aug. 21. 10 cts.

Engineer and the Community, The. By Wm. McClellan. 7 pp., Clarkson Bulletin, July. 10 cts.

Engineering Services in Court Cases. 1 p., Engineering Record, Aug. 7. 10 cts.

Engineering Education and the Kesselslaer Polytechnic Institution. By J. M. Smith. Illustrated, 11-3 pp., Engineering News, Aug. 19. 15 cts.

Education for Engineers. 1-4 p., Municipal Journal and Engineer, Aug. 11. 10 cts.

Need of Industrial Training. A comparison of American and European conditions. By P. Kreuzpointer. 2-3 p., Engineering News, Aug. 19. 15 cts.

Engineering Science and the Practical Man in Engineering. By Antonio Llano. 3 pp., Engineering News, Aug. 19. 15 cts.

House Numbering in Chicago, New System of. 1-2 p., Construction News, July 17.

Town Planning. 2-3 p., Contract Journal Aug. 4. 20 cts.

Prince Rupert as Conceived by Landscape Architect. Illustrated, 10 pp., Architectural Record, August. 25 cts.

National Town Planning Congress at Port Sunlight and Southport, Eng. By F. L. Ford. 11-2 pp., Engineering News, Aug. 19. 15 cts.

Garden Cities. 2-3 p., Indian Public Health, July. 25 cts.

Housing Conditions and Wages on the New York State Barge Canal and on the Ashokan Dam. 31-3 pp., Engineering News, Aug. 5. 15 cts.

Municipal Art in Eugene, Oregon. By G. W. James. Illustrated, 10 pp., The Arena, July. 25 cts.

Art in the Woolwich Borough Library. Illustrated, 11-3 pp., Municipal Journal, July 30. 10 cts.

Civic Improvement and Municipal Advertising. By C. L. Mosher. Paper before Minnesota Federation of Commercial Clubs. 11-2 pp., Canadian Municipal Journal, August. 15 cts.

Gypsy Moths, Newton's War on. Illustrated, 1 p., Municipal Journal and Engineer, Aug. 25. 10 cts.

Municipal Works of Durham. Paper before Institution of Municipal Engineers. Illustrated, 2 pp., Surveyor, Aug. 13. 20 cts.

New Terminal of Public Service Railway at Hoboken, N. J. Illustrated, 41-2 pp., Electric Railway Journal, Aug. 7. 10 cts.

Reinforced Concrete Dock Sheds at Liverpool. Illustrated, 21-2 pp., Cement Age, August. 15 cts.

Shanghai Public Works. Illustrated, 20 pp., Far Eastern Review, June. 25 cts.

Dog Pound, Denver's. Illustrated, 1-2 p., Municipal Journal and Engineer, Aug. 4. 10 cts.

Anti-Grafting Association Proposed. 1-2 p., Municipal Journal and Engineer, Aug. 18. 10 cts.

Anti-Graft Discussion. 1-4 p., Municipal Journal and Engineer, Aug. 25. 10 cts.

Anti-Grafting Discussion. Communication from F. W. Morse. 2-3 p., Municipal Journal and Engineer, Aug. 25. 10 cts.

Filing Fragmentary Literature, System for. By Ernest McCullough. 11-2 pp., Engineering Record, Aug. 14. 10 cts.

BOOK REVIEWS

General Lectures on Electrical Engineering.—By Charles Proteus Steinmetz. 8vo. 284 pages. Schenectady, N. Y.: Robson and Adee. Price, \$2.

This book contains a series of 17 lectures which were delivered by Prof. Steinmetz in the winter of 1907-'08 to a class of young engineers, mostly college graduates; to which are added two appendices, one on Light and Illumination, read before the Illuminating Engineering Society, and the other on Lightning and Lightning Protection, read before the Annual Convention of the National Electric Light Association. While these lectures cannot be said to be at all popular in their style, still they are written in such a way as to be intelligible to any who have an elementary knowledge of electrical terms and theories. The complicated formulas and mathematics which are found in many works on this subject are employed very seldom in this book. The lectures cover the grounds of Distribution, both of Light and Power; Load Factor and Cost of Power; Long-Distance Transmission; Higher Harmonics of the Generator Wave; High-Frequency Oscillations and Surges; Generation; Hunting of Synchronous Machines; Regulation and Control; Lightning Protection; Electric Railway; Electric Railway Motor Characteristics; Alternating-Current Railway Motors; Electro-chemistry; The Incandescent Lamp; and Arc Lighting.

The general characteristics of this work are a most complete and up-to-date knowledge of the subject, including the practical as well as the theoretical side, and an exposition of this information in a concise and simple manner.

Sewage Purification and Disposal. By J. J. Cosgrove, Pittsburg. Standard Manufacturing Company. Cloth, 8vo., pp. 214. Price, \$3.00.

This book is gotten up in an exceedingly attractive form, with excellent illustrations, printed on good paper and with gilt edges. It is described by the publishers as being "the only work of its kind published treating the various methods of purifying sewage." Unless the words "of its kind" refer to the gilt edges, we cannot conceive how such a statement could be made, as there are at least half a dozen works covering the ground much more completely. The various chapter heads include "The Septic Tank," "Intermittent Filtration," "Sprinkling Filters," "Contact Beds," "Irrigation," "Sub-Surface Irrigation," "Chemical Precipitation," "Pumping Plants," "Disposal of Sewage," "Disposal of Effluents," "Disposal of Storm Water," "Designing Sewage Purification Plants." Each of these topics is treated of in a very incomplete way. For instance, under the head of "Septic Tanks" only one is described, a small institutional tank of a design which is certainly not in common use, and nothing is said to indicate that any other design has ever been employed. The chapter on "Designing Sewage Purification Plants" devotes eight pages to designing the sewerage system and two to designing the purification plant, this space also including four tables and diagram. The incompleteness of the treatment is self-evident from this. As an appendix is published a paper on the "Physical Properties of Sands," written by Allen Hazen eighteen or twenty years ago. The author's style is unusually good for a technical book, and in general his statements are correct and accurate. For anyone, therefore, who wishes comparatively light reading on the subject of sewage purification, this work would serve excellently. For the engineer or student, however, we cannot recommend it for the reasons above indicated—that it falls so far short of completely covering the subject.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Street Railways—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we can not guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

| STATE | CITY | RECEIVED UNTIL | NATURE OF WORK | ADDRESS INQUIRIES TO |
|---------------------|-----------------|--------------------|---|--|
| STREET IMPROVEMENTS | | | | |
| New Jersey | New Brunswick | Sept. 2 | Bldg. stone road for County; M.F. Larson Co. Engr., Perth Am. | Frank H. Pownall, Dir. Freeholders. |
| New York | Brooklyn | Sept. 2, 3 p.m. | Resurfacing with asphalt old walks in Ft. Green Park. | Henry Smith, Pres. Park Board. |
| Ohio | Akron | Sept. 2, 11 a.m. | Grading and macadamizing 1 mile of road in Portage twp. | Charles L. Wirth, Clk. Co. Comrs. |
| Ohio | Upper Sandusky | Sept. 2, noon | Grading and stoning road 9.215 ft. long in 2 townships. | J. N. Traxler, County Auditor. |
| Ohio | Toledo | Sept. 2, 10 a.m. | Repairing roads in Oregon and Adams townships. | D. T. Davies, Jr., County Auditor. |
| Pennsylvania | Gallitzin | Sept. 2 | Brick paving 8,500 sq. yds. | D. W. Dillman, Boro. Engineer. |
| New York | Albany | Sept. 2, 1 p.m. | Repair or resurfacing State roads in Dela. and Chemung counties. | S. Percy Hooker, Chm. St. Hwy. Com. |
| Pennsylvania | North Braddock | Sept. 3, 3 p.m. | Grading, curbing, paving, 3 sts. and one alley. | C. E. Stewart, Boro. Engineer. |
| Connecticut | New Haven | Sept. 3 | Paving 3 sts. with crushed stone and tar dressing; portion of Congress st. with shale block and part with wood block. | Public Comm. on Pavements. |
| Indiana | Indianapolis | Sept. 3, 11 a.m. | Constructing boulevard along Fall creek. | Dr. Jamason, Chm. Park Comr. |
| Illinois | Paris | Sept. 3, 7:30 p.m. | Paving South Central avenue. | I. Trogon, Pres. B. L. Impvts. |
| New Jersey | Rutherford | Sept. 3 | Macadamizing or Tarviating Beach street. | F. A. Steadman, Boro. Clerk. |
| Ohio | Youngstown | Sept. 3 | Macadamizing two miles Canfield township. | J. C. Wonders, State Highway Comr. |
| Ohio | Groveport | Sept. 3 | Paving with brick or other material. | H. J. Rostofer, Clerk. |
| Ohio | Silverton | Sept. 4 | Constructing cement sidewalks. | A. E. Sprague, Clerk. |
| Virginia | Roanoke | Sept. 4 | Constructing 1 1/2 to 6 miles macadam road. | P. St. J. Wilson, Hwy. Comr. |
| Ohio | Columbus | Sept. 4, noon | Macadamizing 7 miles, Hess pike, 2 townships. | Walter Braun, County Surveyor. |
| Indiana | Terre Haute | Sept. 4, 11 a.m. | Grading and graveling Flagg rd. 1 1/2 miles and Felling rd. 1 mile. | N. G. Wallace, County Auditor. |
| Indiana | Delphi | Sept. 6 | Bldg. macadam road in Jackson and one in Burlington twp. | M. G. Hann, County Auditor. |
| Indiana | Knox | Sept. 6 | Bldg. gravel road in Wayne and one in Roach twp. | Lee M. Ransbottom, Co. Auditor. |
| Indiana | Greencastle | Sept. 6 | Bldg. 2 1/2 miles macadam road in Floyd township. | D. V. Moffet, County Auditor. |
| Indiana | Scottsburg | Sept. 6 | Bldg. 2 miles gravel road in Finley twp.; cost, \$4,238.60. | Board of Commissioners Scott Co. |
| Indiana | Tipton | Sept. 6, 10 a.m. | Bldg. Edw. Curran et al. gravel road, 3,948 ft. long. | J. F. Barlow, County Auditor. |
| Mississippi | Vicksburg | Sept. 6, 8 p.m. | Paving Cherry st. with any hard material, sewers, etc. | J. J. Hayes, Mayor. |
| Indiana | Shelbyville | Sept. 6, 1 p.m. | Constructing a gravel road in Liberty township. | G. B. Hunter, County Auditor. |
| Indiana | Vernon | Sept. 6, 11 a.m. | Constructing 2.5 miles pike road in Rigger township. | T. L. Thomas, County Auditor. |
| Indiana | Brookville | Sept. 6, 1 p.m. | Constructing highway. | C. A. Miller, County Auditor. |
| Pennsylvania | Canonsburg | Sept. 6, 7:30 p.m. | Laying 2,500 sq. yds. paving, setting 1,600 ft. lin. ft. curb. | A. Sheldon, Pres. Council. |
| Texas | Kountze | Sept. 6, 8 a.m. | Constructing road, 18,000 cu. yds. excavation. | Tom Dies, County Judge. |
| Indiana | Jeffersonville | Sept. 6 | Constructing two miles gravel road. | Board County Commissioners. |
| Ohio | Ironton | Sept. 7, noon | Paving Rome alley with brick. | G. H. Davies, Clk. Bd. Pub. Service. |
| Kansas | Ft. Leavenworth | Sept. 7 | Constructing roads and walks. | Capt. W. D. Davis. |
| Indiana | Rockville | Sept. 7, 1:30 p.m. | Constructing gravel roads. | H. A. Henderson, Auditor. |
| Ohio | Janesville | Sept. 7 | Paving 1.3 miles road with brick. | County Commissioners. |
| Indiana | Kentland | Sept. 7, 1 p.m. | Constructing about 4 miles macadam road. | E. R. Brigham. |
| New Jersey | Bayonne | Sept. 7, 8 p.m. | Paving with asphalt several streets. | W. C. Hamilton, Clerk. |
| New York | White Plains | Sept. 7 | Paving in railroad tracks with brick and macadam. | E. P. White, Clerk. |
| Minnesota | St. Paul | Sept. 7, 10 a.m. | Grading Larpenet avenue. | E. G. Krahmer, County Auditor. |
| Indiana | Fowler | Sept. 7, 1 p.m. | Constructing, etc., 10 roads; cost, \$52,000. | Lemuel Shipman, County Auditor. |
| Indiana | Vincennes | Sept. 7, 2 p.m. | Bldg. 10,520 ft. gravel road in Vigo township. | John T. Scott, County Auditor. |
| Indiana | Williamsport | Sept. 7, 1 p.m. | Bldg. gravel road between Adams and Pine twps., 10,550 ft. long. | Robert L. Winks, County Auditor. |
| Indiana | Hartford City | Sept. 7 | Grading, draining, paving 20,975 lin. ft. road. | L. W. Dougherty, County Auditor. |
| Indiana | Peru | Sept. 7 | Grading, gravel, bldg. bridges, etc., roads Nos. 2 and 3, Erie twp. | Chas. Griswold, County Auditor. |
| Mississippi | Greenwood | Sept. 7, 8 p.m. | Bldg. about 5 miles of concrete sidewalks. | R. H. Hicks, City Clerk. |
| New Jersey | Westfield | Sept. 7, 8:15 p.m. | Improving Prospect st. from Broad st. to Dudley ave. | Lloyd Thompson, Town Clerk. |
| Indiana | Winamac | Sept. 8 | Bldg. gravel road between 3 townships. | T. E. Reese, County Auditor. |
| Indiana | Muncie | Sept. 8 | Bldg. 2 stone roads in Nile and 3 in Union twp.; also gravel road. | Board of County Commissioners. |
| Indiana | Bluffton | Sept. 8 | Bldg. 3 stone roads in 3 townships. | O. D. Garrett, County Auditor. |
| Georgia | Griffin | Sept. 8, 1 p.m. | Brick, wood block, granitoid or bitulithic paving, 32,241 sq. yds. on concrete; 14,589 lin. ft. granite curb; grading, etc. | Hazlehurst & Anderson, Engrs., Candler Bldg., Atlanta. |
| Florida | Pensacola | Sept. 8 | Two miles vit. brick paving, etc., on 2 County roads. | Board of County Commissioners. |
| Kansas | Hutchinson | Sept. 8, 3 p.m. | Paving 36,000 sq. yds. brick, one year guarantee, bitulithic or creosoted blocks, 10-year guarantee; also 7,000 lin. ft. curb and gutter. | G. L. McLane, City Engineer. |
| New Jersey | Atlantic City | Sept. 8 | Grading and paving Shore road from Absecon br. to New Jersey avenue, Som. Pt. | E. D. Rightmire, County Auditor. |
| Pennsylvania | Harrisburg | Sept. 8 | Bldg. 3 sections National road, 16,990 ft. long. | Jos. W. Hunter, State Hwy. Comr. |
| Indiana | Noblesville | Sept. 8, 1 p.m. | Constructing four gravel roads. | N. W. Cogwill, Auditor. |
| Ohio | Akron | Sept. 8 | Paving Washington and 3 other streets. | Board of Public Service. |
| Ohio | Cambridge | Sept. 8 | Paving with brick and macadam several roads. | County Commissioners. |
| Rhode Island | Cranston | Sept. 8 | Constructing 3,000 ft. highway. | J. H. Edwards, Commissioner. |
| Ohio | Cadiz | Sept. 9 | Macadamizing 1.2 miles road. | County Commissioners. |
| Indiana | Frankfort | Sept. 9 | Constructing about 14 miles of gravel roads. | C. F. Cromwell, County Auditor. |
| Pennsylvania | Harrisburg | Sept. 9 | Bldg. 2 sections National road, 5,100 ft. and 7,911 ft. long. | Jos. W. Hunter, State Hwy. Comr. |
| New York | Port Totten | Sept. 10, 11 a.m. | Macadam roads, 667 sq. yds; concrete walk, 5,000 sq. ft.; drain, 665 lin. ft., excav., 2,644 cu. yds. | Constructing Quartermaster. |
| Indiana | Bloomington | Sept. 10 | Constructing 3 gravel roads in Bloomington twp. | Horace Blakely, County Auditor. |
| Ohio | Cincinnati | Sept. 10, noon | Oiling Reading pike, Sycamore township. | Fred. Dreihls, Clk. County Comrs. |
| Virginia | Newport News | Sept. 14 | Paving with vitrified brick and asphalt blocks two streets. | F. A. Hurgins, City Clerk. |
| Tennessee | Knoxville | Sept. 15, noon | Constructing 35 miles of pike road in Anderson Co. | J. K. P. Wallace, Supt. Co. Const. |
| Massachusetts | Ft. Andrews | Sept. 15, 10 a.m. | Constructing roads and walks. | Capt. R. H. Rolfe, Constructing Q.M. |
| Tennessee | Clinton | Sept. 15 | Constructing pike roads. | J. K. P. Wallace, Supt. |
| Ohio | Toledo | Sept. 15 | Macadamizing 3 1/4 miles road 22. | D. T. Davies, Jr., Auditor. |
| West Virginia | Beckley | Sept. 16 | Constructing 3 1/2 miles concrete macadam, 3,000 lin. ft. brick pavement. | G. C. Kedrick, Recorder. |
| Ohio | Cincinnati | Sept. 17 | Improving two roads in Symmes township. | Fred. Dreihls, Clerk. |
| New Jersey | Newton | Sept. 20 | Macadamizing six miles in Hardyston. | A. H. Konkle, County Engineer. |
| Florida | Ft. Dade | Sept. 20 | Constructing 4,150 sq. ft. granolithic walks. | Constructing Quartermaster. |
| SEWERAGE | | | | |
| Ohio | Girard | Sept. 3 | Constructing sewers in District No. 3. | J. F. McFall. |
| Kentucky | Louisville | Sept. 3, noon | Bldg. Dumesnil st. sewer, Contract No. 52. | J. B. F. Breed, Ch. Engr., Sewer Com. |
| North Dakota | Botlineau | Sept. 4 | Constructing 7,700 ft. trunk and lateral sewers. | C. P. Telle, City Auditor. |
| Pennsylvania | Huntington | Sept. 6, 2 p.m. | Constructing disposal plant and storm water sewers at Reformatory. | T. B. Patton, General Superintendent. |
| Mississippi | Greenwood | Sept. 6 | Galv. steel culvert pipes, 14, 16, 18-in. gauge; sizes 12-36 inch. | C. W. Crockett, Chancery, Clerk. |
| Mississippi | Vicksburg | Sept. 6, 8 p.m. | Constructing storm sewer, etc., in Cherry st.; C.R. Twiss, C.E. | J. J. Hayes, Mayor. |
| New Jersey | Irvington | Sept. 7 | Constructing sewers in several streets. | Geo. M. Wills, Chm. Town Council. |
| Iowa | Cherokee | Sept. 7, 8 p.m. | Constructing 20,000 ft. 6, 8 and 10-in. pipe sewers. | W. Shadlow, City Clerk. |
| New York | New York | Sept. 7, 11 a.m. | Constructing 4 outlet sewers. | L. F. Haffen, Pres. Bronx Boro. |
| Pennsylvania | Phillipsburg | Sept. 7 | Reconstructing 3,500 ft. 18-in. pipe sewer and constructing 600 ft. 18-in. pipe sewer on pile and timber foundation. | W. A. H. Streamer. |
| South Carolina | Charleston | Sept. 7, 1 p.m. | Laying terra cotta pipe. | J. H. Dingle, City Engineer. |
| Pennsylvania | Connellsville | Sept. 7, noon | Constructing 3,829 lin. ft. pipe sewer. | A. O. Bixler, Clerk. |

SEWERAGE—Continued

| | | | | |
|---------------------|--------------------|----------------------|---|----------------------------------|
| Ohio..... | Toledo..... | Sept. 7, noon..... | Constructing sewer No. 1082..... | Board of Public Service. |
| Pennsylvania..... | McKees Rocks..... | Sept. 7, 8 p.m..... | Constructing 350 ft. 6-ft. brick sewer..... | G. H. McGinnis, Engineer. |
| Oklahoma..... | Muskogee..... | Sept. 7..... | Constructing sewer No. 15..... | Chas. Wheeler, Jr., City Clerk. |
| Ohio..... | Columbus..... | Sept. 8..... | Bldg. sewers and drains in State University grounds..... | Carl E. Steeb, Sec'y State Univ. |
| New York..... | Buffalo..... | Sept. 8, 11 a.m..... | Constructing 30-36-in. brick sewer and 10-15-in. pipe sewer..... | F. G. Ward, Commissioner. |
| California..... | San Francisco..... | Sept. 8..... | Constructing sewers, \$147,000..... | Board of Public Works. |
| Ontario..... | Orillia..... | Sept. 9, 8 p.m..... | Constructing 15,000 ft. sanitary sewers, pumping machinery and iron force main..... | C. E. Grant, Town Clerk. |
| California..... | San Francisco..... | Sept. 10..... | Constructing sewers, \$16,500..... | Board of Public Works. |
| New Jersey..... | Atlantic City..... | Sept. 13..... | Constructing storm water sewers, 76, 650 ft. brick, conc. and tile..... | E. D. Rightmire, City Engineer. |
| Oklahoma..... | Hartshorne..... | Sept. 13, 8 p.m..... | Constructing sanitary sewer system..... | F. C. Savage. |
| North Carolina..... | High Point..... | Sept. 15, 2 p.m..... | Constructing 1,600 ft. pipe sewer and concrete septic tank..... | G. C. White, Engineer. |
| California..... | San Francisco..... | Sept. 15..... | Constructing main sewer, \$47,000..... | Board of Public Works. |
| Alabama..... | Ft. Morgan..... | Sept. 20..... | Constructing pipe sewers and iron outfall..... | Capt. H. B. Chamberlain, Q.M. |
| Kentucky..... | Louisville..... | Sept. 24..... | Constructing sections, B1, B2, C and D of northwestern sewer..... | W. C. Nones, Chm. Sewage Comm. |

WATER SUPPLY

| | | | | |
|---------------------|-----------------------|----------------------|--|--|
| Ohio..... | Brooklyn Hts..... | Sept. 2, noon..... | Material and labor for laying water mains in 4 streets..... | H. F. Chester, Town Clerk, Cleveland P. O. |
| Illinois..... | Bloomington..... | Sept. 2, 2 p.m..... | Constructing water mains in portions of various streets..... | R. L. Carlock, Chm. Bd. Local Impvts. |
| Missouri..... | Carthage..... | Sept. 3, 8 p.m..... | Constructing concrete reservoir; M. A. Earl & Co., Engineers..... | W. A. Turner, Secy. Bd. Pub. Wks. |
| North Dakota..... | Bottineau..... | Sept. 4..... | Drilling well, constructing water tower, installing pumps; also laying 6 and 8-inch water mains..... | C. P. Telle, City Auditor. |
| Colorado..... | Lamar..... | Sept. 5, noon..... | Constructing earth filled dam, tunnels, etc., for irrigation..... | Two Buttes Irrigation & Reservoir Co. |
| North Dakota..... | Grand Forks..... | Sept. 6, 5 p.m..... | Constructing water main No. 66..... | W. H. Alexander, Auditor. |
| North Carolina..... | Smithfield..... | Sept. 6..... | Constructing system of water works for Court House and Jail..... | Sam T. Honeycutt, Clk. Co. Comrs. |
| Mississippi..... | Vicksburg..... | Sept. 6, 8 p.m..... | Laying water main in Cherry st.; C. R. Twiss, City Engineer..... | J. J. Hayes, Mayor. |
| Colorado..... | Hot Sulphur Spgs..... | Sept. 7..... | Constructing complete system of water works..... | J. R. Palmer, Town Recorder. |
| Wisconsin..... | South Milwaukee..... | Sept. 7, 8 p.m..... | Constructing filter plant, 1,000,000-gal. capacity..... | W. G. O'Neill, City Clerk. |
| Mississippi..... | Macon..... | Sept. 8..... | Remodeling water works and light plant..... | Mayor. |
| Virginia..... | Christiansburg..... | Sept. 8..... | Furn. 6 miles 4 to 10 in. c. i. pipe, specials, etc..... | J. R. Johnson, Chm. Water Comm. |
| Oklahoma..... | Henryetta..... | Sept. 9, 8 p.m..... | Furn. 700 tons c. i. pipe and specials, 4-10-in.; 102 double nozzle fire hydrants; valve and valve boxes; labor and material for laying 9 miles of pipe..... | W. R. Davies, Secy. Lt. & Wtr. Comrs. |
| Pennsylvania..... | Doylestown..... | Sept. 9, 8 p.m..... | Relining and covering reservoir with reinforced concrete..... | A. H. Clayton, Borough Clerk. |
| New York..... | Newburgh..... | Sept. 13, 7 p.m..... | Raising an earth dam and roadway..... | Curtis Stanton, Supt. Water Comrs. |
| Oklahoma..... | Hartshorne..... | Sept. 13, 8 p.m..... | Constructing water works system..... | F. C. Savage, Mayor. |
| Michigan..... | Detroit..... | Sept. 14, noon..... | Three 30,000,000-gal. pumping engines at new station..... | Benj. F. Guiney, Sec'y Wtr. Comrs. |
| Quebec..... | Montreal..... | Sept. 14, noon..... | Widening and deepening city aqueduct, 27,300 ft. long, inc. 1,175,000 cu. yds. earth and 400,000 cu. yds. rock excav. also formation of slopes and banks of new aqueduct, bldg. syphon culverts, dry stone wall lining in slopes, etc..... | George Janin, Supt. Water Works. |
| Virginia..... | Richmond..... | Sept. 14, 4 p.m..... | Furnishing gate valves, c. i. pipe, specials, hydrants, etc..... | E. E. Davis, Superintendent. |
| Brit. Columbia..... | Victoria..... | Sept. 15..... | Supplying 900 tons c. i. pipe..... | T. Lubbe, Sec'y W. W. Co. |
| Tennessee..... | Knoxville..... | Sept. 15..... | Constructing Anderson County turnpike..... | J. K. P. Wallace, Superintendent. |
| North Carolina..... | High Point..... | Sept. 15, 2 p.m..... | Constructing basins, 1,000,000-gal. filter plant, etc..... | G. C. White, Engineer. |
| Ohio..... | Bellaire..... | Sept. 17..... | Paving Bellaire and Shadyside pike..... | County Commissioners. |
| Georgia..... | Marietta..... | Sept. 20, 8 p.m..... | Constructing water works..... | Board of Water Commissioners. |
| Illinois..... | Rock Island..... | Sept. 30..... | Bldg. new filter plant on bluff site..... | M. T. Rudgren, City Clerk. |

LIGHTING AND POWER

| | | | | |
|-------------------|------------------|---------------------|--|---|
| Ohio..... | Delaware..... | Sept. 2, noon..... | Bldg. brick addition to power house at Girls' Ind. Home..... | S. D. Webb, Sec'y Bd. Trustees. |
| New Jersey..... | Irvington..... | Sept. 7..... | Bids, inc. plans, etc., for municipal electric light plant..... | Geo. M. Wills, Chm. Town Council. |
| Louisiana..... | New Orleans..... | Sept. 7..... | Furnishing and installing electric equipment for post-office..... | J. K. Taylor, Superv. Arch., Washn. |
| Ohio..... | Columbus..... | Sept. 9..... | Bldg. brick power plant for State institutions; cost, \$200,000..... | Osborn Eng. Co., c. o. Bd. Prison M'rs. |
| New Mexico..... | Portales..... | Sept. 15..... | Constructing electric light plant..... | Burns & McDonnell, Kansas City. |
| Pennsylvania..... | Pittsburg..... | Sept. 15, noon..... | Furn. and install. air compressor plant, Lock 1, Monon. river..... | H. C. Newcomer, Maj. U. S. Engrs. |
| Kansas..... | St. Johns..... | Sept. 15..... | Constructing electric light plant..... | Burns & McDonnell, Kansas City. |
| New Jersey..... | Orange..... | Sept. 20..... | Bldg. municipal electric light plant, inc. two 160 kw. generators; 13-section switchboard, condenser, steam piping, 365 magnetic lamps, 65 60-watt Tungstens; alternate bids; underground, \$76,000; overhead, \$65,000; Runyon & Carey, Consulting Engineers..... | Arthur B. Seymour, Mayor. |
| California..... | Sacramento..... | Sept. 22..... | Franchise for supplying gas..... | W. B. Hamilton, Clk. Supervisors. |
| Ontario..... | Toronto..... | Oct. 14, noon..... | Furn. four 1,500, four 500 and two 225 h.p. synchronous motors; also two 1,500 and four 500 h.p. induction motors, with exciters, switchboards, connecting material, etc..... | City Engineer. |
| Indiana..... | New Albany..... | Oct. 20..... | Lighting by electricity streets, alleys by electricity for 10 years from Sept. 1, 1910; \$10,000 check with each bid..... | John C. Short, City Clerk. |

BRIDGES

| | | | | |
|-------------------|---------------------|-------------------------|--|---|
| New Jersey..... | Hackensack..... | Sept. 2..... | Constructing concrete bridge Oakland, also concrete floors, other bridges..... | Thos. Post, Chairman Freeholders. |
| Pennsylvania..... | Mercer..... | Sept. 3, 10:30 a.m..... | Constructing reinforced concrete bridge over Saul's run..... | J. A. McGrath, Clerk. |
| Ohio..... | Sandusky..... | Sept. 3, 1:30 p.m..... | Bldg. 30-ft. span arch bridge, 80 ft. wide; entire or sub. and super. over Pike Creek in Perkins township..... | Board of County Commissioners. |
| Pennsylvania..... | Danville..... | Sept. 4..... | Constructing two steel bridges..... | County Commissioners. |
| Mississippi..... | West Point..... | Sept. 6..... | Constructing four bridges..... | L. J. Howard, Clk. Commissioners. |
| Iowa..... | Council Bluffs..... | Sept. 6..... | Bldg. concrete arch at 8th st. concrete slab and girder bridge at Benton st.; cost, \$16,000..... | A. W. Cassidy, City Clerk. |
| Illinois..... | Streator..... | Sept. 6, 7 p.m..... | Erecting reinforced concrete bridge over Vermillion river..... | John B. Patterson, City Clerk. |
| Indiana..... | Shelbyville..... | Sept. 6..... | Bldg. 10 new concrete arch culverts in 5 townships..... | Bd. Comrs., Shelby County. |
| Virginia..... | Wytheville..... | Sept. 6..... | Bldg. bridge over Reed Creek, 1 1/2 miles south over creek..... | John B. Hurt, County Clerk. |
| Mississippi..... | Greenwood..... | Sept. 6..... | Bridge and fill. work, inc. 4 bridges, 220, 75, 100, 75 ft. long..... | C. W. Crockett, Clk. Co. Supervisors. |
| Arizona..... | Phoenix..... | Sept. 7, 2 p.m..... | Designs, plans, etc., for bridge over Salt river; \$5,000 prize..... | Bd. Supervisors of Maricopa Co. |
| Ohio..... | Fostoria..... | Sept. 7, noon..... | Bldg. rein. concrete bridge over Portage Creek in Vine st..... | John A. Sutton, County Auditor. |
| Indiana..... | Brazil..... | Sept. 7..... | Constructing 50-ft. steel bridge..... | J. L. Burnes, County Auditor. |
| Ohio..... | Oliverburg..... | Sept. 7..... | Bldg. 72-ft. concrete bridge over Whetstone Creek..... | Geo. H. Weidner, County Auditor. |
| South Dakota..... | Clear Lake..... | Sept. 7, 2 p.m..... | Bldg. 24-ft. steel bridge, cement foundation; also 24 ft. wood..... | G. E. Force, County Auditor. |
| Maryland..... | Oakland..... | Sept. 7..... | Constructing wrought iron bridge and abutments, span 53 feet..... | A. G. Roas, County Clerk. |
| Illinois..... | Chicago..... | Sept. 8..... | Erecting highway bridges..... | I. J. Bryan, Clk. Sanitary District. |
| California..... | Pala..... | Sept. 8, 2 p.m..... | Furn. material and labor for bldg. bridge over San Luis Ry. river..... | Philip T. Loneragan, Supt. U. S. Reservation. |
| Montana..... | Missoula..... | Sept. 10, 10 a.m..... | Constructing bridge, 260 ft. spans..... | D. C. Curran, Chm. Co. Comm. |
| Florida..... | Jacksonville..... | Sept. 10..... | Constructing steel bridge over Julington Creek..... | County Commissioners. |
| Ohio..... | Columbus..... | Sept. 10..... | Bldg. sub. and superstructure and approaches of Bishop Run bridge; also rein. concrete arch culvert..... | F. M. Sayre, County Auditor. |
| Utah..... | Green River..... | Sept. 11..... | Constructing bridge across Green river..... | Mark Tuttle, Sec'y Joint Board. |
| Ohio..... | Zanesville..... | Sept. 13..... | Constructing steel superstructure 96 1/2 ft. long..... | L. E. Brelsford, County Auditor. |
| Ohio..... | Barberton..... | Sept. 13, 11 a.m..... | Constructing two steel bridges..... | C. L. Wirth, Clerk. |
| Idaho..... | Springston..... | Sept. 14..... | Constructing a trestle for Kootenai County..... | County Surveyor. |
| New Jersey..... | Trenton..... | Sept. 14..... | Constructing steel and concrete bridge in Hopewell township..... | Board of County Freeholders. |
| Ohio..... | Toledo..... | Sept. 18..... | Constructing automatic swing bridge, 14 ft. wide with piers and abutments..... | D. T. Davies, Jr., County Auditor. |
| California..... | Merced..... | Sept. 21, 10 a.m..... | Constructing steel bridge over Merced river..... | P. J. Thornton, Clk. Bd. Co. Supervs. |
| Oregon..... | Umatilla Res..... | Sept. 23, 2 p.m..... | Constructing bridge on reservation..... | E. L. Swartzlander, Supt. |

MISCELLANEOUS

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|--------------------|------------------|------------------------|---|--------------------------------------|
| New Jersey..... | Hoboken..... | Sept. 2, 9:30 a.m..... | Erecting bldg. as children's recreation center..... | Bd. of Playground Comrs. |
| Georgia..... | Fairburn..... | Sept. 3..... | Grading Fairburn & Atlanta Elec. R. R. from Stonewall..... | L. W. & C. S. Roberts, Engrs. |
| Massachusetts..... | Scituate..... | Sept. 3..... | Building concrete sea wall..... | Board of Harbor Commissioners. |
| Pennsylvania..... | Pittsburg..... | Sept. 4, 3 p.m..... | Erecting retaining wall and iron fence around Jefferson school..... | Edward Gessner, Secretary. |
| Louisiana..... | New Orleans..... | Sept. 7..... | Constructing wharf..... | Hugh McCloskey, Pres. Dock Board. |
| Indiana..... | Portland..... | Sept. 7..... | Dredging Salamonie river..... | James Sutton, Superintendent. |
| Indiana..... | Evansville..... | Sept. 9, 10 a.m..... | Furnishing steam roller..... | H. Stinson, Clk. Turnpike Directors. |
| Washington..... | Seattle..... | Sept. 10..... | Furnishing auto-chemical engine and auto-combination wagon..... | Board of Public Works. |

MISCELLANEOUS—Continued

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| Ohio..... | Akron..... | Sept. 10, 11 a.m. | Bldg. tuberculosis hosp.; admin. bldg., dining room, kitchen.... | City Clerk. |
| Florida..... | Pt. McRee..... | Sept. 10, 1 p.m. | Constructing seawall at Fort McRee..... | Capt. H. B. Ferguson, U. S. Engrs. |
| Kentucky..... | Pt. Thomas..... | Sept. 10, 11 a.m. | Constructing garbage crematory..... | Capt. J. H. Wholley, Const. Q.M. |
| Pennsylvania..... | Oil City..... | Sept. 13, 7:30 p.m. | Furn. auto. fire truck, running gear only..... | C. W. Mullalley, City Controller. |
| New Jersey..... | Trenton..... | Sept. 14..... | Constructing tunnel under railroad..... | W. S. Taylor, Director Freeholders. |
| Wisconsin..... | Kenosha..... | Sept. 19..... | Furnish plans for city hall..... | Committee on Buildings. |
| Illinois..... | Chicago..... | Sept. 15..... | Furn. voting machines up to \$400,000 value..... | Election Commissioners. |
| Texas..... | Galveston..... | Sept. 15, noon..... | Furn. and delivering creosoted material and lumber for improving Galv. Ship Channel and Buffalo Bayou..... | John C. Oakes, Capt. U. S. Engrs. |
| New York..... | Pt. Hamilton..... | Sept. 16, 11 a.m. | Constructing garbage crematory..... | Constructing Quartermaster. |
| Massachusetts..... | Lawrence..... | Sept. 17, 3 p.m. | Bldg. fire station at Oxford and Lowell sts.; 2 story, 3-run, brick, stone, iron and wood; cost, \$20,000..... | C. I. Corcoran, City Clerk. |
| Ohio..... | Cincinnati..... | Sept. 20, 2 p.m. | Installing, operating machinery at dam..... | Col. W. T. Russell, U. S. A. |
| Kentucky..... | Guthrie..... | Oct. 1..... | Furn. and erecting 15-ton ice plant for Toad Co. Ice and El. Co. | L. M. Balee, Sec'y Ice & Light Co. |

STREET IMPROVEMENTS

Dothan, Ala.—Citizens have voted \$20,000 street paving bonds.

Montgomery, Ala.—City has not as yet let contract for proposed grading, curbing and paving.—W. Black, City Clerk.

Fratt City, Ala.—Citizens have voted \$15,000 bonds for street improvements.

Selma, Ala.—Council has passed ordinance authorizing paving of Broad st. with asphalt and brick; ordinance for paving Lauderdale st. with creosote blocks is being considered.

Selma, Ala.—Dallas County Commissioners are considering employment of civil engineer to aid them in road building and in location and proper construction of bridges.

Argenta, Ark.—Council has passed ordinances providing for improvements, including sidewalks, curb and gutter, on four streets.

Star City, Ark.—Lincoln County will construct macadam road from Star City to Bayou Bartholomew; distance, 14 miles; cost, \$3,000 per mile.—H. D. Palmer, County Judge.

Tishomingo, Ark.—Citizens have voted \$100,000 road and bridge bonds.

Oakland, Cal.—Bids will be called for shortly for reducing grades leading into 12th st. dam; \$5,000 is available.

Oroville, Cal.—Supervisor E. C. Wilson has announced himself in favor of bond issue of \$400,000 or \$500,000 for construction of good roads in Butte County.

Pasadena, Cal.—City Engineer Van Orum is preparing specifications for paving North Raymond ave.; Colorado st. will be paved with asphalt on concrete base.

Sacramento, Cal.—Board of City Trustees has adopted specifications for improvement of 13th st. with oiled macadam roadway and concrete gutters and curbs.

San Jose, Cal.—County Surveyor Joe G. McMillan will soon submit plans for betterment of 12 miles of main roads leading into this city. Paolo Alto and Gilroy.

San Jose, Cal.—City Engineer will prepare estimate cost of improving San Fernando st.; artificial stone sidewalks will be placed on San Carlos st. and artificial stone curbs and gutters on five streets.

Daytona, Fla.—Florida East Coast Automobile Association is urging Board of County Commissioners to secure a \$250,000 bond issue for building hard surface roads.

Jacksonville, Fla.—Board of Public Works has been instructed to prepare from time to time plans and estimates up to \$25,000 to cover cost of constructing sidewalks; Board will also adopt resolution specifying on what streets walks will be constructed.

St. Augustine, Fla.—Mayor Masters is urging purchase of a portable asphalt repair plant.

Sandpoint, Ida.—Citizens have voted to appropriate \$10,000 for paving.

East St. Louis, Ill.—Street improvements involving expenditure of \$166,000 have been authorized; one ordinance provided for the improvement of Bowman and Exchange aves. from 7th to 9th sts. and 7th st. from Bowman to Exchange; estimated cost, \$24,600.

Evanston, Ill.—Council has appropriated \$10,000 for repairing streets.

Homer, Ill.—City is considering paving of E. and W. Wabash st.; cost about \$20,000.

Moline, Ill.—City will pave First ave.; distance 12 blocks; cost \$54,000.

Quincy, Ill.—Council has adopted ordinances providing for sidewalks on six streets.

Rockford, Ill.—Council has passed resolutions providing for paving certain streets at cost of about \$45,000.

Streator, Ill.—Board of Local Improvements has decided to pave North Park st.; distance one mile.

Evansville, Ind.—Board of Works has ordered construction of sidewalks on six streets.

Fort Wayne, Ind.—Board of Public Works has rejected bids for paving of Reunion ave.; new bids will be advertised for under the old specifications; lowest bid, which was on brick, was just above the legal limit and the property owners objected to cutting down the width of the street.

Indianapolis, Ind.—Board of Public Works has ordered plans for two streets and approved resolutions for improvement of twelve others.

Indianapolis, Ind.—Resolutions for purchase of Ellenberger woods and for acquisition of land and construction of boulevards in the east and west park districts have been confirmed by Board of Park Commissioners.

Knoxville, Ia.—City will expend about \$20,000 for paving with creosoted wood block.—M. G. Hall, Centerville, Engineer.

Mason City, Ia.—City is considering paving of portion of Main st. with brick.—J. H. McEwen, City Clerk.

Abilene, Kan.—City has decided to pave about 12 blocks in the business district.

Lawrence, Kan.—Council has passed ordinance for grading, curbing and paving Berkeley st.—F. D. Brooks, City Clerk.

Baton Rouge, La.—East Baton Rouge Parish will construct 48 miles of dirt road; cost \$350 per mile.

New Orleans, La.—Council is considering advertising for bids for paving sidewalks on seven streets.

Shreveport, La.—Citizens will vote on \$187,000 bonds for street paving.

Lawrence, Mass.—Cost of paving Lowell st. is estimated at \$4,000.

Lynn, Mass.—Council has authorized a \$20,000 loan for street improvements.

South Hadley Falls, Mass.—Town has voted \$2,500 to construct a State highway in Woodbridge st.

Stockbridge, Mass.—Town will again vote on proposition to issue \$3,000 road bonds.

Duluth, Minn.—Citizens will raise \$25,000 for paving Garfield ave.

Grand Rapids, Minn.—Bids will be received Sept. 9, 1:30 P.M. for \$6,500 road and bridge bonds.—J. H. McMahon, Town Clerk.

Brandon, Miss.—Merchants Bank and Trust Co., of Jackson, has been awarded \$5,000 6 per cent bond issue for streets and sidewalks.

Bethany, Mo.—Plans are being prepared by Engineer W. M. Irwin, Maryville, for eight blocks of brick paving.

Maryville, Mo.—Plans are being prepared by City Engineer W. M. Irwin for four blocks of concrete curb and gutter.—M. A. Perry, City Clerk.

Perth Amboy, N. J.—Board of Aldermen has passed first reading ordinance to pave Kearny ave. with asphalt block; King st. will be paved with asphalt block pavement.

Herkimer, N. Y.—County Supervisors have appropriated \$32,000 to finish work on Webb-McKee highway.—C. H. Spohn, Clerk.

Niagara Falls, N. Y.—Aldermen have ordered Lockport st. paved at cost of \$47,873.60.

Rochester, N. Y.—Plans for grade crossing at Lyell ave. over tracks of Charlotte branch of New York Central have been approved by Public Service Commission.

Asheville, N. C.—Swannanoa Township has voted \$30,000 bonds for road improvements.

Greensboro, N. C.—Citizens are considering construction of an improved automobile highway from Lynchburg to Salisbury.

Washington, N. C.—City will vote September 14 on \$25,000 bonds for street improvements.

Bismarck, N. D.—Council has appropriated \$5,000 for street crossings.

Grand Forks, N. D.—Plans will be prepared for paving University ave. this fall.

Minot, N. D.—Commercial Club and County Board will consider improvement of roads in Townships of Harrison and Afton.

Akron, O.—Council has passed ordinances providing for issuing \$33,000 bonds for the paving of portions of seven streets.

Akron, O.—Second National Bank has secured \$16,000 paving bonds at 276 premium; Otis and Hough, Cleveland, and Seasongood and Mayer, Cincinnati, \$2,100 paving; Haydenmuller & Co., Cleveland, \$1,600 street extension, and Fifty-third National Bank, Cincinnati, \$18,240 paving bonds.

Akron, O.—County Commissioners have allowed petition for brick paved road from this city to Twinsburg; cost about \$15,000.

Ashland, O.—City has sold \$4,600 bonds for improvement of Chestnut st. to Ashland Bank and Savings Co. for \$270.67.

Canton, O.—City has sold \$76,000 street improvement bonds to Hayden, Miller & Co., Cleveland, for \$590.

Cincinnati, O.—Surveyor Cowen has estimated cost of improving Loveland and Maderia Pike at \$29,945.

Cincinnati, O.—City Engineer Sundmaker has estimated cost of improving Bassett road with tarvia at \$13,697.70.

Cincinnati, O.—City Engineer will estimate cost of improving Missouri ave. with macadam; Committee on Streets and Parks has estimated cost of improving Morton st. at \$3,385 and Tusculum ave. at \$21,367.

Coitville, O.—County is considering construction of new road in this township.

Port Clinton, O.—Colonial Bank, Fremont, has secured \$4,500 street paving bonds offered by village of Oak Harbor for \$4,590.

Roseville, O.—Council has decided to pave 1st st.; cost about \$3,000.

Wellington, O.—C. E. Dennison & Co. have been awarded \$10,000 North Main st. paving bonds, paying a premium of \$469.

Davis, Okla.—Commercial Club is promoting establishment of rock-crushing plant; cost \$150,000.

Woodburn, Ore.—City Council has passed resolution providing for paving Front st. with bitulithic.

Coudersport, Pa.—Council has decided to macadamize Main and Chestnut sts.

Edwardsville, Pa.—Borough has authorized paving of Church st.—D. J. Edwards, Secretary Council.

Harrison, Pa.—Township will issue \$20,000 bonds for paving purposes.—Thos. Nicholas, President Township Board.

Johnstown, Pa.—Council has passed measures to issue \$100,000 street improvement bonds.

Nicktown, Pa.—Barr Township will urge county to construct 106 miles of road; cost \$800,000.

Pittsburg, Pa.—County Commissioners have rejected as too high bids for improving Greensburg pike No. 2, lock No. 3 and Elkhorn roads; bids ranged from \$46,456.17 to \$158,681.33.—I. K. Campbell, Commissioner.

Pittsburg, Pa.—Business men are urging widening, curbing and paving of South 18th st.

Pottsville, Pa.—Board of County Commissioners has decided to construct road near East Mahanoy Junction.

West Middlesex, Pa.—Borough is considering \$50,000 bond issue for street paving and sewers.

West Scranton, Pa.—Scranton st. will be asphalted.

North Providence, R. I.—Town has appropriated \$3,200 towards building tar macadam road full length of Smith st.

Union, S. C.—City will macadamize Church st. and curb South st.; cost \$12,000.

Athens, Tenn.—Special Road Commissioners have decided to begin work on 31 miles of pike road; road will lead from Athens to Etowah and from Athens to Riceville; three miles of road will also be built from Athens toward Decatur, Mt. Verd and Madisonville, until pike road fund on hand is exhausted.

Bristol, Tenn.—Bids will be received and sale made of \$200,000 bond issue ordered by Sullivan County Court, September 2.

Lexington, Tenn.—L. G. Smith, Jackson, has been selected as engineer to supervise graveling streets; \$10,000 bonds will be available.

Beaumont, Tex.—J. F. Weed, Superintendent of Jefferson County Roads, has stated that he is in favor of building county roads in the future with vitrified brick; cost \$10,000 a mile with a 9-ft. width and \$14,000 with a 12-ft. width.

Beaumont, Tex.—Council has authorized paving of Liberty and Magnolia sts. with bitulithic.

Eagle Pass, Tex.—Maverick County will make a number of road improvements; \$30,000 available.

Galveston, Tex.—Citizens are urging paving of Market st.

Hillsboro, Tex.—Commissioners' Court has ordered election September 18 on \$250,000 bonds to macadamize roads.

Matador, Tex.—Motley County Commissioners will issue \$20,000 bonds for road improvements.

San Antonio, Tex.—Sutherland Springs

Development Co. will improve 30-mile road from this city to Sutherland Springs.—W. E. Nelson, Manager.

Sour Lake, Tex.—County Commissioners have advertised for bids to grade and establish first-class road between Saratoga and Batson.

Wharton, Tex.—Citizens will vote September 17 on \$8,000 bonds to improve streets and construct sewers.

Willard, Utah.—County Board of Supervisors have appropriated funds for improvement of county road between this city and Brigham.

Clarendon, Va.—King st., at Overlook, will be paved with vitrified brick; cost \$20,000.—Geo. E. Garrett, St. Elmo, Engineer.

Norfolk, Va.—Finance Committee has approved recommendation of Improvement Committee for paving two streets; cost \$8,000.

Walla Walla, Wash.—Boulevards will be built on both sides of Mill Creek.

Parkersburg, W. Va.—Council has passed ordinance for paving Murdock ave.; cost \$15,324.10.

BIDS RECEIVED AND CONTRACTS AWARDED

Birmingham, Ala.—The Graves-Matthews Paving Co. has secured contract to pave 3d ave. at \$27,830.

West Blocton, Ala.—City has awarded contract to C. M. Birkhalter, Birmingham, Ala., for street improvements cost, \$3,500.

Long Beach, Cal.—Anselme de Grieve has secured contract to pave four streets, at \$11,000.

Marysville, Cal.—Bids for the Morrison grade work and work on California Midland grade opened by the Board of Supervisors, August 21, were as follows: Louis Moreing, of Stockton, 22½¢ a cu. yd. for filling on each grade; E. E. Roddan, of Wheatland, 25¢ a cu. yd. on the Morrison grade; Harry J. Gray, of Sacramento, 22¢ a cu. yd. on the Morrison grade and 25¢ a cu. yd. on the Midland grade.

Pasadena, Cal.—Contract for street work on Delmar st. has been awarded to J. C. Kinsman for \$2,644.15; on Worcester ave. to Charles A. Baldwin for \$501.54; on Buckeye st. to Charles A. Baldwin, \$24.60; on Catalina ave. to Desire DeGryse, \$3,791.20.

Hartford, Conn.—Contracts for construction of State road work, bids opened by State Highway Commissioner, have been awarded as follows: City of Ansonia, 5,510 lin. ft. macadam-telford road on North Main st., to Frank Breault, Ansonia, at 72¢ per sq. yd. for macadam, 89¢ per sq. yd. for telford, \$750 for rock excavation, and 40¢ per sq. yd. for cobble gutters. Other bidders were: B. D. Pierce, Jr., Bridgeport, \$1,06, \$1,66, \$2,000 and 65¢; Joseph Mascetti, Torrington, 76½¢, \$1,26, \$1,300 and 45¢; Edward McManus, Waterbury, \$1,06½, \$1,19½, \$1,600 and 50¢; John Davidson, Ansonia, 76¢, 91¢, \$725 and 35¢; A. Brazos & Sons, Middletown, 73¢, 97¢, \$500 and 60¢. Town of East Lyme, 5,840 lin. ft. gravel-telford road on the Boston Post road, including six 24-in. and two 15-in. tile culverts, to Bryan F. Mahan, New London, at \$1.49 for gravel and \$1.87 for telford. Other bidders were: F. Arrigoni & Bro., Durham, \$1.59 and \$2.05; B. D. Pierce, Jr., Co., Bridgeport, \$1.56 and \$2.16; A. Brazos & Sons, Middletown, \$1.66 and \$1.99. Town of Old Lyme, 12,768 lin. ft. gravel-telford road on the Boston Post road, including two 18-in. and five 24-in. tile culverts and two re-inforced concrete bridges, to Bryan F. Mahan, New London, at \$1.49 for gravel and \$2.18 for telford. Other bidders were: A. Brazos & Sons, Middletown, \$1.65 and \$1.98; F. Arrigoni & Bro., Durham, \$1.59 and \$2.05; B. D. Pierce, Jr., Co., Bridgeport, \$1.92 and \$2.52.

Atlanta, Ga.—Druid Hills Corporation has awarded contract at \$35,000 to Georgia Granite Co., Atlanta, for constructing 14 miles of sidewalk and curbing in Druid Hills.

Boise, Ida.—Lowest bids opened Aug. 12 by Board of Public Works for constructing sidewalks and curbs in District No. 30 were submitted by A. C. Sunton, at \$21,977, and William Beavers, at \$22,123.

Aurora, Ill.—Board of Local Improvements has awarded McCarthy Improvement Co. contract for improving South ave. at \$10,927.

Joliet, Ill.—Ross & Curtis, only firm to enter bid for macadamizing Hunter ave., have been awarded contract by Board of Local Improvements. Their bid was well inside the engineer's estimate.

Oswego, Ill.—Harry H. Enbody, Aurora City, has been awarded contract to lay 10,000 ft. of cement sidewalks.

Peoria, Ill.—Board of Local Improvements has awarded contract for paving Western Ave. to John McAllister on his bid of \$16,335.20; four bids were opened.

Indianapolis, Ind.—Union Asphalt Construction Co. was low bidder for improve-

ment of Kentucky ave. former bids rejected; bids were as follows: For Trinidad pitch lake asphalt, \$3.37 a lin. ft., and \$3,900 for intersections; for California asphalt, \$3.12 a lin. ft., and \$3,500 for intersections.

Scottsburg, Ind.—Thomas M. Carlisle, city, has secured contract for gravel roads in Jennings and Johnson Townships, for \$12,243.

Cedar Rapids, Ia.—Bids were opened Aug. 16 for paving with brick block on a 4-in. concrete foundation, five streets; also constructing curbs on four streets; contract has been awarded to M. Ford, city, for about \$29,000.—L. J. Storey, City Clerk.

Montezuma, Ia.—Council has awarded contract for 27,000 sq. yds. of brick paving to M. Ford, of Cedar Rapids, at \$1.99½ per sq. yd.

Catlettsburg, Ky.—City has awarded contract to Samuel Steele Construction Co., city, for proposed Oakland ave. paving; vitrified brick with concrete base on curb and gutter; contract price, \$30,000. Geo. Mason, City Engineer.

Lexington, Ky.—Mayor Skain has let contract for placing sidewalk curbs on North Limestone from 3d st. to Loudon ave. to C. C. Miller & Co.

Louisville, Ky.—Board of Public Works has awarded contracts for paving with brick on portions of three streets to G. W. Gosnell, and a portion of Dumesnil st. to L. R. Figg. Stabler & McFarland secured contract to construct brick gutters on portions of numerous streets; total cost about \$40,000.

Maysville, Ky.—Council has opened bids for 833,000 sq. ft. of cement sidewalks. O. S. Hord, city, was successful bidder for 42,000 sq. ft. and Thos. Evans, Cincinnati, was awarded 41,000 sq. ft. at \$1375 per sq. ft.

Baltimore, Md.—State Roads Commission has awarded contract at \$31,586.06 to McCormick & Co., 15 South Broad st., Philadelphia, Pa., for constructing 3.14 miles of road from Centerville toward Church Hill, and awarded contract at \$26,252.10 to F. M. Latham, 144 West North ave., Baltimore, for constructing three miles of road from Chestertown to Church Hill.

Baltimore, Md.—Board of Awards has awarded contract for paving Pen Lucy ave. with vitrified brick to William Elder & Co., for \$4,019; same contractor was given contract for Mondowmin ave. between Auchentoroly Terrace and Reisters-town road, with sheet asphalt, for \$17,174.

Cumberland, Md.—Street and Alley Committee has opened bids for paving on several streets and awarded contracts as follows: Lefevre & Edwards, Cumberland, Paca and Johnson sts., \$11,200; Harrison st., \$3,450; Cumberland st., \$3,500; Frederick Perry, Cumberland, Bedford st., \$3,633.

Cumberland, Md.—Contract for paving Fayette st. has been awarded to Mr. Thos. S. Keane at his bid of \$8,233.

Saugus, Mass.—Charles N. Wormstead has been awarded the contract for widening and regrading Lincoln ave. for \$1,549.99 and for widening the wooden bridge, \$450. W. G. Greenlay bid \$1,934 and \$490, respectively.

Springfield, Mass.—United States Wood Preserving Co., New York, has secured order for wooden paving blocks to be used in State st; 3,000 yds. will be needed; cost, \$10,000.

Bay City, Mich.—William Carlson will receive contract for construction of three-quarters of mile of Saginaw road, at \$1,245.

Flint, Mich.—Lennane Bros., Detroit, have secured contract to pave 13,000 sq. yds. on Industrial ave., and the Flint Coal Co., city, contract to furnish 540,000 Saginaw brick, all cement, hand and gravel needed for the work.

Senatobia, Miss.—J. N. Ryan, of Columbia, S. C., has secured contract for 4 miles of street paving, at 10¢ per sq. ft.

Helena, Mont.—Bids have been opened for street work in District 35, and the bid of the Miracle-Tripp Co. has been recommended for award as follows: 19,000 cu. yds. of excavation, 60¢; 32,100 lin. ft. concrete curb, 38¢; 197,000 sq. ft. concrete walks, 16.5¢; 3,920 lin. ft. cross walks, \$1; 16,900 ft. old walks removed, 1¢; 3,500 cu. yds. loam for parks, \$1.40; 1,047 trees planted, \$1.05; 1,047 tree holes dug, 60¢; 1,500 lb. of grass seed sown, 20¢; 3,250 ft. of 1¼-in. gal. pipe laid, 39¢; 80 double water connections, \$24; 15 street boxes, \$5.50; 57,000 sq. yds. rolling streets, 1¢; 1,800 street letters, 1¢; 4 catch basins, \$20, and 200 ft. of 8-in. vit. pipe laid, 60¢; total, \$71,177. Totals of other bids: Louis Johnson, \$71,037; Adams Bros., \$193,173, and William McMillan, \$87,546.

Omaha, Neb.—Bids were opened Aug. 17 for Purlington brick block paving, about 6,200 sq. yds., and asphalt paving, about 4,400 sq. yds. Hugh Murphy, Bee Building, was lowest bidder for both contracts.—G. H. Craig, City Engineer.

Hudson, N. H.—Osgood Construction Co., of Nashua, has secured contract for building section of State road.

Hoboken, N. J.—Council has received bids on repaving certain streets in city, and Henry Waddington, being the lowest bidder on the work to be done on Hudson pl. and on Hudson st., from Newark st. to Hudson pl., was awarded the contract. William Connell was given the contract for building the box sewer on Jackson st.

Kearny, N. J.—Council has awarded contract for paving Argyle place to Van Keuren & Son, who will receive \$2,225.50 for the work. Christian Levison got contract to make the sewer connections in the same street, his bid being \$86.40.

Albany, N. Y.—Bids were received Aug. 17 by the State Commission of Highways for repairs of improved highways as follows: Repair contract No. 19, East Ave. road No. 5, County of Monroe, R. M. Cowles, \$16,940, awarded contract; Frank L. Cohn, Buffalo, \$17,700; Frederick A. Brotsch, Jr., Rochester, \$19,000; A. J. Rockwood, Rochester, \$17,500. Repair contract No. 20, Section 1, road No. 6, same county, Thomas Rucknall, Albion, \$22,044; Frederick A. Brotsch, Jr., Rochester, \$18,000, awarded contract; George F. Cook, Glens Falls, \$24,445; H. C. Schroeder, Rochester, \$19,757; John Boylan, Barnard, \$19,596; A. J. Rockwood, Rochester, \$19,500. Repair contract No. 21, Scottsville, Section 1, road 3, same county, Thomas Hucknall, \$24,740; Hollihan & Daley, Rochester, \$24,283; Frederick A. Brotsch, Jr., \$22,400, awarded contract; A. J. Rockwood, \$24,000; H. C. Schroeder, \$23,957. Repair contract No. 22, Delaware Turnpike, Sections 1 and 2, roads 7 and 41, Albany County, M. F. Dollard, Albany, no gross sum; Alonso Schapp, Albany, \$9,806, awarded contract. Repair contract No. 24, Monroe County, road No. 60, Fairport road, Monroe ave. road No. 94, Frederick A. Brotsch, Jr., \$11,100; Horace E. Lapp, Rochester, \$10,941, awarded contract; Thos. Hucknall, Albion, \$12,138; W. H. Murray, Pittsford, \$12,606; Hollihan & Daley, Rochester, \$11,820. Repair contract No. 25, Monroe County, road No. 98, Webster, Section 1, Road No. 168, Dugway, Section 1, road 172, Portland ave., Frederick A. Brotsch, Jr., \$10,216; Star Contracting Co., Glens Falls, \$14,340; Thomas Hucknall, Albion, \$12,071; J. W. Lewis Constructing Co., Rochester, \$9,950. Repair contract No. 27, Erie County, road No. 23, Frank H. Cohn, Buffalo, \$3,989; Thomas Hucknall, Albion, \$3,919; Frederick J. Munn, \$3,294, awarded contract. Repair contract No. 26, Monroe County, road 80, Section 1, road 171, Section 1, road 257, Section 4, Thomas Hucknall, Albion, \$12,515, awarded contract, and Frederick A. Brotsch, Jr., \$14,000.

Fort Plain, N. Y.—Board of Trustees has decided to award paving contract to the Patrick D. Collins Co., of Ithaca; it was also voted to pave Division st. with Clearfield brick and United States brick, the curb stone to be of Madeira sandstone.

Jamaica, L. I., N. Y.—The Astor Construction Co. has secured contract for regulating portions of New York ave. and Fleet st., Jamaica, for \$68,225.

Newton, L. I., N. Y.—The Long Island Construction & Supply Co. has secured contract for regulating Shell road, for \$44,377.

New York, N. Y.—Bids were opened Aug. 12 at the office of Louis F. Haffen, President Bronx Borough, for street improvements, as follows: Regulating, grading, setting curb, flagging sidewalks, laying cross walks, building approaches and placing fences in 230th st., from Bailey ave. to Riverdale ave. Lowest bidder, McDonald & Barry, as follows: 1,000 cu. yds. excavation, \$1; 116,000 cu. yds. filling, 35¢; 4,300 lin. ft. new curb, 75¢; 260 lin. ft. old curb, 10¢; 16,250 sq. ft. new flag, 23¢; 1,000 sq. ft. old flag, 5¢; 1,900 sq. ft. of new bridgestones for crosswalks, 45¢; 3,650 cu. yds. of dry rubble masonry in retaining walls, culverts and gutters, \$2.50; 700 cu. yds. of rubble masonry in mortar, \$4; 150 lin. ft. vitrified stoneware pipe, 12 in., 1¢; 100 cu. yds. class A concrete, \$8; 275 cu. yds. class B concrete, \$7; 25 M. ft. lumber, furnished and laid, \$65; 2,700 lin. ft. guard rail in place, 20¢; 12,500 lin. ft. bearing piles, 40¢; 1,000 cu. yds. rock filling, \$2; 21,750 lbs. steel, 5¢; 10,000 lbs. reinforced bars, 5¢; total, \$74,897.

Regulating, grading, setting curb, flag, etc., on Olinville ave., between Bronx and Pelham Parkway and Burke ave. Lowest bidder, F. V. Smith Contracting Co., 147 E. 125th st., as follows: 17,050 cu. yds. rock excavation, \$1.40; 54,750 cu. yds. filling, 50¢; 9,370 lin. ft. new curb, 85¢; 36,300 sq. ft. new flag, 25¢; 4,840 sq. ft. new bridgestone for crosswalks, 50¢; 320 cu. yds. dry rubble masonry in retaining walls, culverts and gutters, \$3, and 5,960 lin. ft. of guard rail, 25¢; total, \$72,929.

Lowest bids received for regulating, grading, setting curb and flagging other streets in Bronx Borough are as follows: Commonwealth ave., from West Farms road to Westchester ave., the Wakefield Construction Co., \$26,709; Astor pl., from Olinville ave. to White Plains ave., J. B. Malatesta, 3169 Jerome ave., \$7,565; Teller ave., from East 170th st. to Morris ave., L. C. Rose,

737 East 180th st., \$14,988; Westchester sq., West Farms road and Lane ave., J. Farrell, 2139 Crotona ave., \$7,592; and Edgewater road, from Harrison ave. to Seneca ave., C. Schneider, office at Findlay ave. and 167th st., \$10,899; intersection of Westchester and Tremont aves., J. E. Malatesta, 3169 Jerome ave., \$10,560.

The Barber Asphalt Paving Co., 150th st. and Harlem River, submitted lowest bid for paving with asphalt block the following streets in Bronx Borough, on Aug. 12: Park ave. West, from East 175th st. to East 178th st., \$14,648; Hoe ave., from Freeman st. to East 172d st., \$14,414; East 135th st., from 3d ave. to Alexander ave., \$8,335; Beck st., from Longwood ave. to Intervale st., \$5,204.

Niagara Falls, N. Y.—Contract for paving 7th st., bids opened July 20, has been awarded to Reed-Coddington Engineering Co., of Niagara Falls, N. Y., for \$23,491.—R. A. McClanathan, City Engineer.

Rensselaer, N. Y.—Council has awarded contract for paving with brick three streets to Wiltse & Rigney, for \$15,818.

Rochester, N. Y.—Contract, bids opened Aug. 11 by the Board of Contract for paving with brick Gilmore st. has been awarded to W. A. Margrander, for \$6,007.

Saratoga, N. Y.—Barber Asphalt Paving Co. has been awarded contract for paving with asphalt strip of six and a half miles of State road in Saratoga County.

Schenectady, N. Y.—Contract for paving Van Gulsing ave. has been awarded to Union Paving Co.; bid \$5,201.36.

Cincinnati, O.—County Commissioners have awarded contract for improvement of the Ohio pike to Thomas J. McKim at his bid of \$20,223.28. There were seven bidders, and all but two were under the Engineer's estimate of \$23,097.72.

Contract for resurfacing Cleves and Warsaw pike, through Addyston, was awarded to William Harrell & Co. for \$4,198.88, the estimate being \$5,586. There were five bidders.

Bids were opened for improvement of State road; estimate for work is \$14,488; following submitted bids, which were referred to County Surveyor Cowen for computation: A. P. Toph, E. Thomas, H. Westerman, Nugent & Hines, W. Harrell & Co. and Joseph Gradison.

Columbus, O.—Contract for macadamizing the Pontius road, bids opened Aug. 14, has been awarded to Winchell & McDaniel, 101 Clinton Building, Columbus, O., for \$10,170.

Columbus, O.—County Commissioners and State Highway Commissioner have granted contract to J. M. Snouffer for building State road known as Fuller Mill road; length 1½ miles; contract price, \$9,410.

Delaware, O.—Following are bids opened Aug. 6 for paving on West Winter st. (a) brick, (b) wood block, (c) asphalt block, (1) stone curb, (2) cement curb: Lambert Bros. (a1) \$12,424, (a2) \$12,208, (b1) \$18,844, (b2) \$18,629, (c1) \$17,670, (c2) \$17,455; Hazleton & Frost, (a1) \$13,201, (a2) \$12,773, (c1) \$18,131, (c2) \$17,910; Peters & Sons, (a1) \$14,074, (a2) \$13,456, (b1) \$21,265, (b2) \$20,649; with Carba Vla, \$11,139 stone curb, \$10,523 cement curb.

Hamilton, O.—Following contracts have been awarded: J. C. Brate, to construct a concrete steel box culvert at the Margaret Agnew property near Port Union for \$126,005; George Emmons, to construct concrete steel box culverts at Philip Wylie and Thomas McCormick's farms, Rely Township, for \$126.47 and \$126.18.

Ironton, O.—County Commissioners have awarded contracts to successful bidders on the new county roads as follows:

Turnpike No. 1, extended, Azro Lunsford.

Superior turnpike, Sisler & Mapes.
White Oak turnpike, James Jenkins and Elias Jenkins.

Elkins Creek, section 3, Syd Willis.
Section 4 Jno. Capper and Madison Gore.
Section 5, Capper and Gore.

Buckeye, section 1, Jno. Roush and Geo. Woolum.

Symmes Creek, section 1, H. B. Dillon.

Section 2, H. B. Dillon.

Section 3, C. J. Hulbert.

Section 4, W. B. Hockenberry.

Section 5, Wm. Dillon.

Section 6, Jno. Stewart and Cal. Haskins.

McKinney, section 1, J. W. Neal.

Section 2, W. H. Wood.

Big Paddy Creek, section 1, Benj. Dillon.

Boulah, section 1, Benj. Dillon.

Rankins Creek, section 1, Ed. Snyder.

Section 2, W. H. Wood.

Section 3, J. W. Neal.

Greasy Ridge, section 2, Ed. Massie and Frank Dillon.

Section 3, W. C. and B. B. Morris.

Section 4, Capper and Mannon.

Leatherwood, section 1, W. H. Wood.

Section 2, W. H. Wood.

Section 3, J. W. Neal.

Section 4, W. H. Jenkins and W. A. Corbin.

Big Branch, section 1, Albert Bennett.

Section 2, Albert Bennett.
Section 3, Albert Bennett.
Long Creek, section 1, D. W. Whitrock.
Section 3, W. C. Morris.
Section 4, Geo. Capper.
Section 5, Geo. Capper.
Section 6, W. C. Morris.

Millersburg, O.—Contract for about 5,000 sq. yds. of brick paving, with concrete curb, has been awarded by Village to Lee & Griggs, of Clyde, at \$7,505.—R. G. Defrees, Engineer.

St. Clairsville, O.—Contract for macadamizing 1.19 miles of road in Goshen Township, bids opened Aug. 20, has been awarded to William Moore, of St. Clairsville, for \$7,179.—R. H. Cope, County Auditor.

Youngstown, O.—Road Commissioners of Road District No. 1 have secured bids for construction of 1½ miles of the Four-Mile-Run road; specifications call for a furnace slag base, 6 in. thick and 10 ft. wide; top to be of limestone, 8 ft. wide, 5 in. thick in the middle and 3 in. at the sides. Following bids were received: G. W. Ripple, \$8,071.95; Martin Connelly, \$5,877.50; L. H. Young, \$6,050; G. A. Gialdini, \$7,000; S. H. DeGroodt, \$7,000; Waldeck & Ready, \$8,071.

The contract was awarded to Martin Connelly for \$5,877.50, he being the lowest bidder. Work will be started September 1.

Youngstown, O.—Bids were received Aug. 24 for contract for paving Glenaven st.; McGraw & Morrison bid \$3,621.64, and Turner & Alson bid \$3,645.15. These were the low bids. For paving East Wood st. with brick, James McCarron was low bidder, at \$4,270.01; McCarron was also low bidder for paving Illinois ave. with brick, his bid being \$4,794.10. Oscar Alm was low for grading Davis st., with a bid of \$550.

Hamburg, Pa.—The Warner-Quinlan Co., 428 South Salina st., Syracuse, N. Y., has received contract at \$1.56 per sq. yd. and 75c. per lin. ft. for sheet asphalt pavement and granite curb, respectively; work includes 1,650 sq. yds. of sheet asphalt pavement and 760 lin. ft. of curb.

Johnstown, Pa.—Bids for construction work on about one-third of proposed boulevard between Somerset and Johnstown have been received by the State Highway Department. Contracts may be awarded very soon.

In the detailed bids as given below, estimates include culverts of cast-iron pipe or of corrugated pipe.

Following are bids in detail on three sections of road:

For 3,160 ft. in Somerset Borough—Somerset Construction Co., native stone bottom, brick top, \$9,646.80; Commonwealth Construction Co., New York, Ligonier stone bottom, brick top, \$12,148.83; McLaughlin Construction Co., Pittsburg, stone bottom, brick top, \$9,811.30; J. C. McSpadden, native stone bottom, brick top, \$7,772.37; Rudolph & Means, Punxsutawney, local stone bottom, Rockwood brick top, \$10,373.10; Thomas Sweeney & Co., Pittsburg, Ligonier stone bottom, Maxwell brick top, \$9,646.80; W. H. Herr, Altoona, bluestone bottom, brick top, \$8,791.98; Hallam Construction Co., Washington, local stone bottom, brick top, \$10,031.98; Crossan Construction Co., Brownsville, stone bottom, brick top, \$10,815.50.

For 19,610 ft. in Somerset Township—Crossan Construction Co., native stone bottom, Dunbar stone with asphalt top, \$80,729.96; McCormick & Co., Philadelphia, local stone bottom, Rockland limestone with asphalt top, c. i. p., \$63,614.80, c. p., \$62,832.80; Hallam Construction Co., native stone bottom, Ligonier stone with asphalt top, c. i. p., \$64,826.82; Thomas Sweeney & Co., native stone bottom, Ligonier stone and asphalt top, c. i. p., \$50,271.09; Conestoga Construction Co., Pittsburg, local stone bottom, Ligonier or limestone with Standard Oil asphalt top, \$52,214.19, local stone bottom, Ligonier or limestone with asphaltollene, \$55,700.39; Rudolph & Means, local stone bottom, Ligonier or trap with Standard Oil asphalt top, c. i. p., \$51,108.26, c. p., \$50,620.76; Commonwealth Construction Co., New York, Ligonier stone bottom, Ligonier and asphalt top, \$58,226.72; Somerset Construction Co., native stone bottom, Ligonier with Genasco asphalt top, c. i. p., \$45,873.54, c. p., \$45,461.04; J. C. McSpadden, native stone bottom, Ligonier stone and asphalt top, c. p., \$42,981.62, c. i. p., \$44,537.62; McLaughlin Construction Co., native stone bottom, limestone or Gulf Refining asphalt top, c. i. p. or c. p., \$42,990.95, native stone bottom, native limestone top alone, \$39,504.75; Ridge Brothers & Co., Pittsburg, stone bottom, stone and asphalt top, c. i. p., \$68,985.70, c. p., \$68,353.70.

For 20,463 ft. in Lincoln Township—Commonwealth Construction Co., Ligonier stone Ligonier stone or sample and asphalt top, \$64,968.96; Crossan Construction Co., native stone bottom, Dunbar stone and asphalt top, \$78,334.11; Ridge Brothers & Co., stone bottom, stone and asphalt top, c. i. p., \$71,910.05, c. p., \$70,559.55; Thomas Sweeney & Co., native stone bottom, Dun-

bar and Indian Refining asphalt top, c. i. p., \$63,457.04, c. p., \$62,966.52; Rudolph & Means, local stone bottom, Ligonier and Standard Oil asphalt top, c. i. p., \$59,047.45, c. p., \$58,302.15; Somerset Construction Co., local stone bottom, Ligonier stone and Genasco asphalt top, \$66,289.85; Conestoga Construction Co., native stone bottom, Ligonier or limestone with Standard Oil asphalt top, \$58,150.58; W. H. Herr, local stone bottom, Ligonier bluestone with American Asphaltum Co.'s asphalt top, c. p., \$45,287.44, c. i. p., \$45,961.26; J. C. McSpadden, native stone bottom, Ligonier stone with Amiesite or Indian Refining asphalt top, c. i. p., \$60,696.35; McCormick & Co., local stone bottom, Rockland stone and asphalt top, c. i. p., \$84,012.65, c. p., \$83,100; McLaughlin Construction Co., native stone bottom, limestone and Guly Refining asphalt top, c. i. p. or c. p., \$49,735.45, native stone bottom, native limestone alone top, \$46,097.55.

Tonesta, Pa.—Bids for reconstruction of Elm st., from Bridge st. to Station 94, have been opened by the State Highway Department, Harrisburg; in all six bids were submitted as follows: Anderson & Putnam, Oil City, \$6,727.20; Sutley & Sutton, Franklin, \$7,930.02; Charles Ott, Warren, \$8,595.02; E. M. Love & Son, Corry, \$8,793; W. H. Amsler, Franklin, \$9,694; W. C. Evans, Ambler, \$12,865.10.

Chattanooga, Tenn.—Board of Public Works has awarded contract to West Construction Co., 1001 Market st., at \$8,718.13 for construction of proposed chert roadway, Districts 5 and 136, Greenwood st., Ninth Ward; concrete curb, gutters and sidewalk included.—H. F. Van Dusen, Chairman.

Knoxville, Tenn.—The bid upon improvement district No. 81, Temple ave., has been opened and contract for asphalt pavement awarded to Barber Asphalt Paving Co. at \$1.78 per sq. yd.

Knoxville, Tenn.—Knox County Commission has awarded contracts for \$3,000 additional pike work in the county.

J. W. Gillespie was awarded Pickens Gap work, to cost about \$1,000.

On Sharp's Gap pike, J. S. Hodge was awarded contract to do \$2,000 worth of work on the extension of that pike.

Sherman, Tex.—City has awarded contract for construction of one mile of concrete sidewalk in Fifth Ward.

Tacoma, Wash.—Board of Public Works has opened bids for paving Puyallup ave. and Bay st.; Wells Construction Co. was the lowest bidder; bids generally were very low, and in all cases estimate of \$170,933 was underbid. Using brick, the Wells Construction Co. will pave Puyallup ave. and Bay st. for \$129,835; fir blocks, \$129,835; granitoid, \$111,342. To granitoid bid \$1,600 is to be added if it is found that a royalty must be paid. The D. A. Williams Co. will lay paving for \$141,810, using granitoid. His bid on brick is \$142,480, and on fir blocks \$143,270. The Rudolph S. Blome Co. bid only on granitoid, the amount of its proposal being \$148,500. Wright & Sweeney bid \$153,881 for the use of brick and \$153,875 on fir blocks.

Wheeling, W. Va.—Board of Control has awarded contract for new steam roller to Kelley Springfield Road Roller Co., Springfield, O., at that company's bid of \$2,750.

De Pere, Wis.—There were but three companies who entered bids for paving of Broadway, one from the McGrath Construction Co., of Green Bay, the Schuette Cement Construction Co., of Manitowoc, and the J. Rasmussen & Sons Co., of Oshkosh. The McGrath bid was the lowest, his bid being 47c. per ft. for curb and gutter work and \$1.31 per sq. yd. for the street work. The Rasmussen bid was 46c. per ft. for the curb and gutter and \$1.42 for the street work, and the Schuette company's bid was 50c. for curb and gutter work and \$1.41 for street work.

SEWERAGE

Dothan, Ala.—Citizens have voted \$8,000 bonds for sewer extension.

Pratt City, Ala.—Citizens have voted \$45,000 bond issue for sewer construction.

Little Rock, Ark.—Commissioners of Sewer District No. 55 will construct sewers; cost \$4,900.—H. A. Pittard, Secretary.

Bisbee, Ariz.—City Engineer Norton is preparing specifications for construction of sewer extension in Clawson Addition.

Anaheim, Cal.—Plans have been approved for sewer system; citizens will soon vote on bonds.

Corona, Cal.—Bids will be received about September 15 for sewer work; cost \$30,000; storm drains, cost \$91,000, and for grading, cost \$14,500.—E. J. Genereux, City Clerk.

Pasadena, Cal.—Plans and specifications and resolution of intention for big storm drain have been adopted by Board of Trustees of South Pasadena; cost \$37,000.

San Francisco, Cal.—Plans are being prepared for construction of main sewer on Fulton st.; cost about \$65,000.

San Francisco, Cal.—Board of Public Works has decided to advertise for bids for Ocean ave. and Arlington ave. sewers, the H st. sewer and the sewer in the Bay View district.

Waterbury, Conn.—City Engineer has estimated cost of installation of a storm water conduit in vicinity of Round Hill at \$15,000.

Collegepark, Ga.—City has appointed committee, C. A. Wickersham, Chairman, to investigate advisability of installing sewer system.

Sandpoint, Ida.—City has selected Prof. Ogden, Ithaca, N. Y., to superintend installation of sewer system.

Yale, Ida.—City has decided to construct new sewerage and water system.

Brocton, Ill.—City will lay about one mile of sewerage pipe.

Hoopeston, Ill.—City will construct new sewer system.—C. F. Helman, City Engineer.

Joliet, Ill.—Board of Local Improvements is considering advisability of constructing extensive sewer system in the Third Ward, to include North Hickory, Broadway, Elizabeth, Cora, Moran and other streets.

Venice, Ill.—City is considering construction of sewer system; cost \$150,000.

Elkhart, Ind.—Board of Public Works has adopted resolution for storm water sewer on Marion st.; cost \$1,129.95.

Davenport, Ia.—Engineer Allen Boudinot has presented to Board of Supervisors estimate of cost of building proposed drainage ditch in Butler Township; work will cost \$12,500; canal is to be about four miles long and will be entirely in Butler Township.

Mason City, Ia.—City is considering construction of sanitary sewer in portion of 1st st.—J. H. McEwen, City Clerk.

Leavenworth, Kan.—Board of Commissioners has sold \$45,000 sewer bonds to Fairchild & Lewis.

Hammond, La.—Citizens will discuss sewerage question Sept. 15; \$100,000 bond issue is being considered.

Westboro, Mass.—Engineer J. J. Van Valkenberg has prepared plans for sewerage system; cost \$19,722.45; Engineer recommends that four new filters be constructed, old filters repaired and screen house relocated.

Cassopolis, Mich.—Committee of citizens consisting of C. H. Kimmeler, W. W. Reynolds, E. H. Black, D. L. Kingsbury and Dr. W. C. McCutcheon will visit Durand, Ithaca and other points in Michigan for an investigation of the sewer system; tentative plans have been prepared.

Escanaba, Mich.—Plans have been completed by City Engineer D. A. Brotherton for sanitary sewers on Jennie and Fannie sts.

Willmar, Minn.—Council is considering issuing of \$12,000 bonds for sewers.

Magnolia, Miss.—City has decided to extend sewer system through residence section.

Shelbina, Mo.—Council is considering construction of sewerage system.

Springfield, Mo.—Plans are being prepared by City Engineer Horton for construction of six sewers.

St. Joseph, Mo.—Plans have been prepared by Assistant City Engineer W. K. Seitz for main sewer; cost \$14,000; for four other main sewers, of concrete, reinforced concrete and vitrified pipe; cost \$8,000; also for two miles of 10 to 24-in. sewers.—Geo. F. Barnes, Secretary.

Webb City, Mo.—Citizens have voted \$2,500 sewer bonds.

Crawford, Neb.—Survey is being made by Engineer P. A. Edquist, Omaha, for installation of sewer system.

Hartington, Neb.—Bids will soon be asked for construction of vitrified pipe sewers; cost \$10,000.—Arnold Koenig, Bee Bldg., Omaha, Engineer; B. Ready, City Clerk.

Bridgeton, N. J.—Council has selected firm of Williams, Proctor & Potts to prepare plans for a sewage disposal plant.

Chatham, N. J.—Borough Council has passed resolutions calling for election Sept. 22 on construction of sewage disposal plant.

Freehold, N. J.—City has decided to build extension to its sewer system; work may be commenced this fall; cost \$30,000; plans include three pumping stations to be used in connection with the present sewage farm.

Paterson, N. J.—Board of Public Works has decided to construct sewer on Crosby ave.

South Amboy, N. J.—Mayor Scully has recommended construction of a sewer system.

Fultonville, N. Y.—Civil Engineer William H. Van Wie has completed plans for construction of new sewer system.

New York, N. Y.—Bids will be received by Park Board September 2 for furnishing and delivering vitrified stoneware drain pipe, No. 1, 1909, for Bronx parks.—Henry Smith, President.

Niagara Falls, N. Y.—Aldermen have voted \$45,500 to construct tunnel trunk sewer in Whirlpool st.

Rensselaer, N. Y.—Council has decided to construct 8-in. vitrified pipe sewers in the northern and southern sections of city.

Schenectady, N. Y.—Board of Control and Supply has advertised for bids for sewers in three streets and one avenue.

Waterloo, N. Y.—Citizens have voted bonds for construction of sewer system; cost \$90,000.

Gastonia, N. C.—S. S. Morris and John O. Ranwin have been appointed as committee to investigate cost of constructing septic tank at outlet of sewerage mains.

Reidsville, N. C.—Citizens will vote October 5 on \$100,000 bonds for construction of sewer system.

Akron, O.—Second National Bank has secured \$2,100 sewer bonds at \$23.80 premium.

Akron, O.—North End citizens are urging establishment of a \$350,000 sewage disposal plant.

Alliance, O.—Board of Public Service has passed resolution instructing City Solicitor to draw up ordinance for issuance of city bonds to provide funds for construction of proposed new sewage disposal plant, plans for which have been approved.

Cincinnati, O.—Council has decided to lay sewers in three streets; cost \$17,332.

Norwalk, O.—Council has decided to install sewer on Manahan ave.—T. P. Kellogg, Clerk.

Tahlequah, Okla.—Citizens have voted \$30,000 bonds for construction of a system of sewers.—Natt T. Wagner, Municipal Water Co.

Barnesboro, Pa.—Town is considering installation of a sewage disposal plant.

Brockton, Pa.—Village Council has decided to construct 4,500 ft. of sanitary and storm sewers.

Hazleton, Pa.—Council is considering construction of system of sewers on Vine and two other streets.

Lebanon, Pa.—Board of Directors of Penn Chautauqua is considering plans for installation of sewage disposal plant near Lake Conewago.

West Middlesex, Pa.—Borough will consider installation of sewerage system; \$50,000 bonds may be issued for sewers and streets.

Woonsocket, R. I.—City will construct sewer system.—Frank E. Holden, Chairman Sewer Committee.

Corsicana, Tex.—Council has passed ordinance ordering election on \$20,000 bonds to extend the sewer system of the town.

Galveston, Tex.—City Engineer Dickey has estimated cost of box drain to be built on 45th st. at \$11,036.25.

San Antonio, Tex.—Beacon Hill District has voted \$20,000 bonds for construction of sewers.

Snyder, Tex.—Council is considering election on \$50,000 bonds for sewerage and water works system.

Front Royal, Va.—City is considering installation of sewer system.—C. A. Ford, Secretary.

Bellingham, Wash.—City Engineer H. W. Troutman has estimated cost of constructing concrete pipe trunk sewer to drain Meridian st. district at \$19,242.

Milwaukee, Wis.—Council has adopted report recommending employment of experts to study sewerage system with view to relieving conditions in Menomonee Valley.

BIDS RECEIVED AND CONTRACTS AWARDED

Birmingham, Ala.—C. M. Burkhalter has secured contract for sewers at \$10,934.50.

Little Rock, Ark.—Joseph McCoppin, city, has secured contract for constructing sewer in Sewer Dist. 52 for \$8,741.

Mountain View, Cal.—John McReynolds, of San Jose, has secured contract for constructing sewer system for about \$25,000.

Cedartown, Ga.—City has awarded contract to R. H. Wright Contracting Co., Birmingham, Ala., for sewer extensions.

Prophetstown, Ill.—Contract for constructing new sewer system has been awarded by Board of Local Improvements to Dearborn & Jackson, of Cedar Rapids, Iowa, at \$8,229.

Anderson, Ind.—Daniels-Lyst Co., of Anderson, has secured contract for building sewer in Shadeland District, for about \$5,099.

La Fayette, Ind.—The Board of Public Works has awarded contract to William F. Frey for constructing sewers in Alabama st., at about \$7,748.

Rockville, Ind.—C. E. Corey, city, has been awarded contract for constructing sewer system for new hospital, for \$3,999.

Louisville, Ky.—Bids were opened Aug. 13 by the Commissioners of Sewerage for sewer on Ewing ave., Contract 50, and the lowest bid received was that of M. J. Burke, of Sandusky, O., as follows: 1,545 lin. ft. earth excavation at \$2; 907 lin. ft. earth excavation at \$1.60; 806 lin. ft. earth excavation at \$1.35; 1,700 cu. yds. rock at \$2; 350 cu. yds. concrete at \$8; 50 cu. yds. brick

masonry at \$8; 525 sq. yds. vitrified brick paving at \$1; 20 cu. yds. excavation below masonry at \$1; 20 cu. yds. gravel refill at \$1.50; vitrified pipe, \$6,666; 4,963 lin. ft. pipe laying 10c.; 1,050 lin. ft. pipe laying in chimneys at 10c.; total, \$20,071. Total of other bids: E. A. Barker & Son, city, \$25,318; Louisville Contracting Co., city, \$28,192; E. G. Nave Bros. Co., Portsmouth, O., \$30,860.

Boston, Mass.—The T. J. Young Co., city, has secured contract for constructing sewers in Washington st., West Roxbury, for \$7,907.

Westfield, Mass.—Contract for laying pipes and draining north and west sides of Park square has been let to Daniel Dorey; work will be started as soon as the pipe arrives.

St. Paul, Minn.—The Board of Public Works has awarded contract for Atwater st. sewer system to the General Contracting Co., 445 Temple court, for \$46,000.

Binghamton, N. Y.—The Board of Contract and Supply has awarded contract for construction of Main st. storm water sewer to John Tyne, at \$6,366.

Brooklyn, N. Y.—Bids were opened by Bird S. Coler, Borough President, for furnishing material and constructing sewer in J. 18th, Nostrand and Flatlands aves., and the following are the bids received on the percentage basis, Engineer's estimate of cost, \$151,025: Sigretto & Meninno Co., 90.75 per cent.; Charles A. Meyers, 83 per cent.; Day J. Stewart, 91.5 per cent.; Long Island Contracting & Supply Co., 102.3 per cent.; Donegan & Redmond Co., 94 per cent.; Hammond & Sloane Co., 99.5 per cent.; Charles Cranford, 103.9 per cent.; Paladico & Papa, \$4.99 per cent.; James Kelly, 103.9 per cent.; O'Grady Bros., 93.5 per cent.; Litchfield Construction Co., \$6.97 per cent.; Merrill Ruckgaber Co., 50 Church st., N. Y. City, 113.5 per cent.; James H. Holmes, 93 per cent.; Culp & McCauley, 78.97 per cent.; Newman & Carey Co., 84.73 per cent.

Brooklyn, N. Y.—Lowest bid opened by Bird S. Coler, Borough President, for the construction of a sewer in Flatbush, below Fisk terrace, was that of Culp & McCauley, of Gravesend ave., at \$121,000.

Olean, N. Y.—Bids have been opened by Council for constructing outlet sewer about 2.4 miles in length in the 8th Ward, and for an additional outlet sewer in three wards, in all 1.3 miles in length; contract has been awarded to Kuhn & Applegate, at \$14,565.—Charles Keenan, City Clerk.

Schenectady, N. Y.—Contract for storm water sewers in Bridge st. has been let to Kellam & Shaffer, at \$2,118.20; sanitary sewers in Seneca st. will be put down by DeNallo & Klingberg, whose bid was \$720. Contract for the sanitary sewers in Foster ave. by Thomas Crane, whose bid was \$702.30.

Utica, N. Y.—Board of Contract & Supply has awarded contract for sewer in York st. to J. W. Johnson; his bid for sewer in Capital ave. has been rejected.

Winston-Salem, N. C.—Contract for the new southwest sewer district has been let to Winston Mill Supply Co.; line will contain about 2,600 ft. of sewer and will drain five streets.

Cincinnati, O.—Board of Public Service has awarded contract to Thomas D. Strack for sewers in Glenway and Grand aves., at \$14,453, and to the Connelly Construction Co., for sewers on Seeger and Vinton sts., at \$7,643.

Hamilton, O.—W. H. Louthan has been awarded contract by Board of Public Service for sanitary sewer in Hanover st., and sanitary sewer and house connections in East ave., at \$7,119.

Xenia, O.—Trustees of Ohio Soldiers and Sailors' Orphans' Home have awarded contract for installation of sewage disposal plant at institution to General Concrete Construction Co., of Cleveland, whose bid was \$13,307.25.

Newkirk, Okla.—E. M. Eby, Welling, has been awarded a contract for constructing sewers for \$23,801, as follows: 900 ft. 15-in. pipe, 0-5 ft. deep, \$55; 6,600 ft. 12-in. pipe, 5-7 ft. deep, \$45; 3,800 ft. 10-in. pipe, 7-9 ft. deep, \$37; 34,700 ft. 8-in., 9-11 ft. deep, \$46; 11-14 ft., \$58; over 14 ft., \$10 extra; manholes, \$30; flush tanks, \$60; septic tank, \$2,200. Totals of other bids were: McIntyre & Teese, Wichita, Kan., \$25,568; Katz & Craig, Omaha, Neb., \$25,942; W. H. Coyle, Guthrie, Okla., \$26,105; Lund & Cuyan, Ponca City, Okla., \$27,036; T. R. Stone, Lima, O., \$28,631; S. H. Crishmell, Muskogee, \$29,204; T. W. Roberts, Kansas City, Mo., \$29,228; L. B. Khusey, Muskogee, \$29,478; Healy Con. Co., McAlister, \$27,277; O. K. Stone Co., Tulsa, \$30,500.—E. G. Davis, City Clerk.

Portland, Ore.—Lowest bid opened Aug. 13 for construction of the Johnson Creek sewer has been submitted by the Pacific Coast Construction Co., City, for \$9,741.

Blakeley, Pa.—Bids for sanitary sewer, cost \$45,000, have been opened by Borough Council and the contract awarded to T. P. Cummings, Joseph Johnson and Thomas

Nolan, of Dubois, Pa., the lowest bidders. The next lowest bidder was Stephen Flannigan & Son, of this city. Figures of the successful bidders were as follows: 8-in. tiling or sewer pipe, 65c. per lin. ft.; 10-in., 70c.; 12-in., 75c.; 6-in. house connections, 55c.; manholes, \$35 each. With these prices prevailing the approximate cost to the property owners of a 50-ft. lot will be between \$43 and \$45.

Stephen Flannigan & Son, of Scranton, the second lowest bidders, prices were as follows: Main 12-in. pipe, 98c. per lin. ft.; house connections, 65c. per ft.; manholes, \$40.

Hugh Atkinson, of Carbondale, the third lowest, submitted prices as follows: Main pipe, 98c.; house connections, 48c.; manholes, \$45. 45c. per yd. for bulkheads.

The other bidders were: E. D. Reed, of Meadville, Pa.; the Engineering Construction Co., Vincent O'Hara and James J. Manley.

Carbondale, Pa.—Contract for laying of sewer course on Pike st. from Sand st. to the White Bridge has been awarded to J. J. Jones & Co. Their bid was 89c. per ft. The other bids were: Harris & Co., 88c. per ft., and J. J. Mannion, \$1.16 per ft.

Erie, Pa.—Council has awarded to Geo. Waller & Co., of Pittsburg, contract for five of the six sections of the Mill Creek intercepting sewer system, and the other section to Knobloch & Shelton, of Erie; total cost about \$50,000.

Wilkes-Barre, Pa.—Bids for construction of North Pennsylvania ave. sewer were opened Aug. 25 by Sewer Committee, and contract awarded to D. M. Rosser, of Kingston, at \$77,629.77, for a 7-ft. brick sewer. Bid of Joseph Hendler was lower than that of the successful contractor, but was informal. Including the rejected bid five were submitted, which were as follows: Daniel S. Baeder, Philadelphia—Brick, \$81,888.93; Meriweather concrete pipe, \$72,768.93; reinforced concrete pipe, \$66,768.93; Parmley patent pipe with haunches, \$69,768.93. Hawman Brothers, Philadelphia—Brick, \$86,760.46; Meriweather concrete pipe, \$73,160.21; reinforced concrete pipe, \$76,160.21. Bolton G. Coon Construction Co.—Brick, \$85,373.60; Meriweather concrete pipe, \$81,196.60; reinforced concrete pipe, \$80,898.60; Parmley patent pipe with haunches, \$74,713.70. D. M. Rosser, Kingston—Brick, \$77,629.77; Meriweather concrete pipe, \$69,481.50; reinforced concrete pipe, \$69,487.92; Parmley patent pipe without haunches, \$60,488.42; Parmley patent pipe with haunches, \$62,488.42. Joseph Hendler, Wilkes-Barre, not considered—Brick, \$75,522; Meriweather concrete pipe, \$61,932; reinforced concrete pipe, \$66,762; Parmley patent pipe without haunches, \$66,762; Parmley patent pipe with haunches, \$74,362.

Newberry, S. C.—Commissioners of Public Works have let contract for extension of sewerage system to Bowe & Page, of Augusta, Ga., for \$34,622.71; contract includes about five and a half miles of sewerage and the building of a septic tank. Other bids submitted were: Walton & Wagner, of Atlanta, \$36,239.26; J. W. Gurvey & Co., of Knoxville, \$42,018.40; Berg-house & Moffitt, of Pennsylvania, \$39,080.20; Geo. W. Waring, of Columbia, \$36,864.90; McKay Engineering Co., \$38,744.61.

Ipswich, S. D.—Contract for installing complete sewer system, with filtration and purification plant, has been awarded to Tanner Bros., of Webster, S. D., for \$18,085; system will be completed by January 1.

Everett, Wash.—The Everett Construction Co. has been awarded contract for proposed sewer in the northwest part of the city at \$27,974.

Kent, Wash.—L. Y. Stayton has been awarded contract for installing sewer system, at \$18,929.

Beloit, Wis.—Bids for the sanitary and storm water sewers were opened by Board of Public Works August 20 and bid of G. Maffiola, of Rockford, will be recommended for acceptance to the Council. Maffiola's bid was: 837 ft. of 20-in. storm water sewer, 90c. per ft.; 4,730 ft. of 8-in. sanitary sewer, at 60c. per ft.; one manhole for the storm water sewer, \$25; 19 manholes for the sanitary sewer, \$30 each, and one flush tank for the sanitary sewer, \$60. The only competitor was J. Rasmussen & Sons Co., of Oshkosh, whose bid for the same job was as follows: Storm water sewer, \$1.20 per ft.; sanitary sewer, 82½c. per ft.; 29 manholes at \$30 each and one flush tank at \$75.

WATER SUPPLY

Dothan, Ala.—Citizens have voted \$6,000 bonds for extension of water works.

Pratt City, Ala.—Citizens have voted \$15,000 bonds for water works.

Conway, Ark.—Board of Trade has taken necessary steps to organize Conway into an improvement district to supply water works.

Searcy, Ark.—City is considering issuance of \$80,000 bonds for water works and sewerage system.

Colusa, Cal.—Plans will be prepared for new water works system.

Oakland, Cal.—Park Commission has decided to call for plans and specifications for pumping station at Independence Park; also to install pump at East Lake Park.

Sacramento, Cal.—Sacramento Valley Irrigation Co. will construct dam at Clear Lake.—Delaware Trust Co., Wilmington, Del., is interested.

San Bernardino, Cal.—Consolidated Reservoir & Power Co. has been incorporated to construct reservoir in Riverside county on Elsinore Lake.—Edwin Moore, Los Angeles, President.

San Francisco, Cal.—Board of Public Works has extended time for opening bids for furnishing and delivering to city and county quantity of cast steel specials, estimated at approximately 2,373 tons for the auxiliary salt water supply system for fire protection.—Marsden Manson, City Engineer.

Arvada, Col.—Citizens have voted \$40,000 bonds to construct municipal water works.

Grand Junction, Col.—A. E. Bayliss and Geo. Smith are interested in construction of Whiteside reservoir.

Hugo, Col.—Town has granted Hugo Water, Light & Power Co. 20-year franchise to furnish water and electricity for lamps; cost of combined plants, \$70,000.

Madison, Fla.—Bids will be received September 22 for \$5,000 water works, \$25,000 sewerage and \$15,000 dormitory bonds.—R. H. Rowe, Mayor.

Collegepark, Ga.—City has appointed Charles A. Wickersham, J. C. Woodward, W. S. Cox, A. C. Brown and P. H. Brewster to investigate advisability of installing water works plant.

Savannah, Ga.—City is preparing for extension of water mains on Bull st. to 47th st.; a 500-ft. extension in the Roach tract and a 1,000-ft. extension in West Savannah.

Caldwell, Ida.—City will extend water mains at a cost of \$10,000.

Ashkum, Ill.—City has decided to install water works system.

Benton, Ill.—C. E. and F. O. Hamilton are considering plans for construction of a water works and light plant.

DeKalb, Ill.—City Engineer will prepare plans and advertise for bids for a 12-in. water main on Main st.—C. G. Bodman, City Clerk.

Rankin, Ill.—Village will soon vote on construction of a water works system.

Hamburg, Ia.—Citizens will vote on extension of water works to South Hamburg.

Madison, Ind.—Council has decided to improve city water works, including the sinking of two to eight new wells.

Rock Rapids, Ia.—City will build new power house and install new pumps at water works plant.

Louisville, Ky.—Louisville Water Co. has completed survey for pipe line from their pumping station to Lakeland Asylum.

Alexandria, La.—Citizens have voted \$40,000 bonds for extension of water works and electric light plant.

Baltimore, Md.—F. P. Stearns and J. R. Freeman, experts to Water Board, have decided that city will have to filter the gunpowder water supply.

Takoma Park, Md.—Citizens will vote September 13 on \$10,000 bonds to install filtration plant with daily capacity of 150,000 gallons of water, install water meters and raise dam over Sligo Creek.

Towson, Md.—Highways Commission has granted franchise to Aighurth Well Co. to lay water mains through portion of this town.—Albert S. Cook and T. Scott Offutt, Incorporators.

Amherst, Mass.—Amherst Water Co. has advertised for bids for erection of dam across Amethyst brook at West Pelham for new reservoir.

Lynn, Mass.—Municipal Filtration Co., of New England, has submitted a proposition to Mayor J. E. Rich and Water Board to establish a filtration plant at cost of about \$580,000.

Cold Spring, Minn.—Citizens have voted \$11,000 bonds for installation of a water works and sewerage system.

Tylertown, Miss.—City is considering installation of water works and artesian well.—G. H. Collins, Mayor.

Springfield, Mo.—City is considering building of \$1,000,000 reservoir.

Vandalia, Mo.—City is considering establishment of water works system.

Bozeman, Mont.—Bids will be advertised for enlargement of reservoir; cost \$12,833.

Belden, Neb.—Plans are being prepared by Engineer Arnold Koenig, Bee Bldg., Omaha, for system of water works, consisting of one 50,000-gallon standpipe and 15 to 20-hp. gasoline pumping engine.—F. B. Barber, City Clerk.

Claremont, N. H.—Town Water Commissioners will purchase lands on mountain

in reservoir district for better protection of city water supply.

Haledon, N. J.—Citizens have voted \$10,000 bonds to complete water system.

South Amboy, N. J.—Mayor Scully has recommended city's acquisition of a water supply system.

Ventnor City, N. J.—Council has passed an ordinance for issuance of \$30,000 bonds for installation of salt water fire mains; bids will also be asked for laying 8-in. water main along entire boat line.

Woodbridge, N. J.—Township is considering furnishing Keasbey with water.

Athens, N. Y.—George Ferguson, New York, is considering installation of water works.

Barker, N. Y.—City is having plans prepared to pipe water from Lake Ontario.

Long Beach, L. I., N. Y.—The Long Beach Water Co. has been incorporated by E. M. Hungerford and J. E. Humbert, Brooklyn; capital \$500,000.

Niagara Falls, N. Y.—Council has authorized Water Board to purchase more land needed in connection with new water system.

Niagara Falls, N. Y.—City has awarded \$300,000 water bonds to I. H. Sperrill at par.

Painted Post, N. Y.—Bids will be received for system of water supply, including reservoir and electric pumping station.—Knight & Hopkins, Rome, Engineers; A. D. Stevens, Chairman Village Board.

Seneca Falls, N. Y.—Village Trustees have been enjoined from issuing \$240,000 bonds for construction of municipal water system.

Mooresville, N. C.—City has sold \$15,000 bonds for water works.—A. Osborne, of Newton, Engineer.

Akron, O.—President Watters of Service Board is urging construction of larger water mains.

Mt. Healthy, O.—Weil, Roth & Co. have been awarded \$32,000 water works bonds at \$126.85.

Newport, O.—City will expend \$85,000 on pumping engine, new supply main and general betterment of water works.

Niles, O.—City has sold \$5,000 water works extension bonds to Seasongood & Mayer, Cincinnati, at \$282.

Oakley, O.—Bids will be received September 7 for \$3,000 water, \$2,000 sewer and \$2,500 sidewalk bonds.—O. Kosche, Village Clerk.

Warren, O.—Citizens will vote October 9 on \$250,000 bonds for building municipal water plant.

Altus, Okla.—City will spend \$160,000 for installation of water works plant and erection of additions to the present lighting plant.—W. O. Crisman, City Engineer.

Cheyenne, Okla.—Citizens will vote on \$25,000 water works bonds.

Muskogee, Okla.—Bacone University has petitioned city to extend water mains.

Taloga, Okla.—Citizens have voted bonds for installation of water works system.

Cottage Grove, Ore.—City is considering plans for securing water from Lang Creek; distance 18 miles.

Portland, Ore.—Water Department will extend main on Everett st.; cost about \$5,000; water mains to Mount Scott will be extended; cost \$75,000.

Hazleton, Pa.—Hazleton Water Co. has asked permission to make numerous changes in pipe line system.

Pittsburg, Pa.—Mayor W. A. Magee will propose that Councils authorize for submission to the people bond issues aggregating \$2,500,000, namely, \$1,200,000 for a reservoir for the North Side; \$800,000 for additional pumping machinery at the filtration plant and \$500,000 for water meters to be installed throughout city.

Shrewsbury, Pa.—Borough has voted to borrow \$12,000 for construction and operation of a water works system.

Harrisville, R. I.—Town will install municipal water system.

Frederick, S. D.—Citizens have voted \$3,500 bonds for drilling well and extending water mains.

Binghamton, Tenn.—Town Council has advertised for bids for construction of system of water mains; plans prepared by Engineer J. A. Omberg, Jr., provide for use of septic tanks for disposal of sewage.

Athens, Tex.—City is considering installation of water works system.—O'Neill Engineering Co., Dallas, Engineers; C. H. Coleman, Mayor.

Leonard, Tex.—Citizens have voted for sinking of artesian well and installation of complete system of water works.

Quanah, Tex.—Citizens have voted \$30,000 additional water works extension bonds.

San Angelo, Tex.—Local Water Works Company is making arrangements to install filtering systems calling for expenditure of several thousand dollars.

Snyder, Tex.—Council is considering election on \$50,000 bonds for water works and sewerage system.

Toyah, Tex.—F. C. Billingslea has presented proposition to Toyah Commercial

Greenwich, Conn.—Bids received Aug. 24 by Greenwich Water Company for raising Putnam Dam:

| CONTRACTORS | Stripping | Rolled Earth Embankment | Earth Exc. for Highways | Rock Exc. | Concrete | Rubble Masonry | Paving for Culverts, etc. | Rip-Rap on Dam | Rip-Rap on Roadway | Cobble Gutter | Cement | Bridge | Wire Fencing | Timber-Railing | Man-holes | 15" Culvert | Total Bid |
|----------------------------|------------|-------------------------|-------------------------|------------|------------|----------------|---------------------------|----------------|--------------------|---------------|-------------|--------------|--------------|----------------|-----------|-------------|-------------|
| | 3,000 yds. | 30,000 yds. | 20,000 yds. | 1,000 yds. | 1,000 yds. | 1,100 yds. | 1,000 yds. | 1,800 yds. | 3,000 yds. | 340 yds. | 3,000 bbls. | 1 | 6,500 ft. | 2,500 ft. | 4 | 60 ft. | |
| A. Lamb & Co. | \$0.50 | \$0.75 | \$0.55 | \$3.00 | \$6.50 | \$4.00 | \$1.25 | \$1.70 | \$1.35 | \$0.50 | \$2.13 | \$425 | \$0.05 | \$0.25 | \$62.50 | \$2.00 | \$65,565.00 |
| Joseph Christiano | .75 | .54 | .50 | 1.18 | 6.53 | 4.59 | 3.08 | 2.78 | 2.65 | .75 | 1.75 | 378 | .08 | .35 | 40.00 | 1.25 | 64,776.00 |
| The Bunting-Bull Co. | .40 | .70 | .65 | 2.00 | 6.00 | 4.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 350 | .25 | .50 | 100.00 | 1.00 | 63,425.00 |
| Erastus E. Burns | .35 | .65 | .32 | 1.75 | 10.00 | 6.75 | 1.2 | 5.60 | 1.00 | 1.00 | 1.75 | 350 | .50 | .10 | 65.00 | 2.00 | 59,775.00 |
| Pierson Eng. & Con. Co. | .60 | .65 | .55 | 2.50 | 5.00 | 4.00 | 1.25 | 1.10 | 1.00 | .60 | 1.90 | 300 | .30 | .20 | 50.00 | 1.00 | 59,344.00 |
| Parker & Beebe | .45 | .45 | .45 | 1.50 | 5.40 | 5.40 | 2.00 | 2.00 | 2.00 | .90 | 1.67 | 200 | .20 | .25 | 50.00 | 1.00 | 55,991.00 |
| Hartford Pav. & Con. Co. | .50 | .47 | .41 | 3.00 | 8.50 | 5.50 | .60 | 1.10 | .60 | .75 | 1.95 | 300 | .30 | .20 | 50.00 | 1.00 | 54,845.00 |
| I. N. H. Cornell & Co. | .45 | .45 | .32 | 1.50 | 5.25 | 4.50 | 1.65 | 2.25 | 1.75 | 1.75 | 2.06 | 225 | .12 | .12 | 55.00 | .60 | 52,236.00 |
| The Foye-Root Co. | .45 | .35 | .35 | 1.50 | 6.00 | 5.55 | 1.15 | 1.50 | 1.00 | .75 | 2.00 | 700 | .20 | .15 | 60.00 | 1.50 | 48,265.00 |
| Coughlin & Shields Co. | .33 | .45 | .33 | 1.50 | 5.87 | 5.60 | .75 | 1.50 | .75 | .50 | 1.60 | 400 | .15 | .22 | 30.00 | 1.00 | 47,395.00 |
| Acken Nightingale Con. Co. | .25 | .50 | .40 | 2.00 | 4.00 | 3.00 | 1.10 | .95 | .80 | .60 | 1.85 | 327 | .17 | .25 | 40.00 | 1.00 | 46,291.00 |
| Lehigh Contracting Co. | .50 | .45 | .35 | 1.50 | 5.25 | 4.75 | .75 | .85 | .65 | .50 | 1.70 | 400 | .10 | .08 | 50.00 | 1.00 | 44,985.00 |
| Sillery-Pierce Co. | .35 | .43 | .37 | 1.60 | 5.00 | 3.50 | .60 | 1.00 | .50 | .75 | 1.80 | 270 | .17 | .14 | 50.00 | 1.00 | 43,340.00 |
| Roger B. Kennedy | .37 | .39 | .42 | 1.63 | 3.48 | 2.68 | .91 | .98 | 1.03 | .53 | 1.67 | 47c. per lb. | .14 | .13 | 35.00 | 1.16 | 41,875.80 |
| John O. Merritt Co. | .40 | .35 | .40 | 1.00 | 4.73 | 4.00 | .75 | .75 | .75 | .35 | 1.60 | 200 | .18 | .15 | 35.00 | 1.50 | 41,074.00 |
| Lafferty & Weir | .59 | .35 | .32 | 1.10 | 3.80 | 3.50 | .80 | .90 | .85 | .50 | 1.75 | 250 | .20 | .14 | 35.00 | .80 | 39,898.00 |
| Engineer's estimate | \$0.50 | \$0.70 | \$0.35 | \$2.00 | \$4.50 | \$4.00 | \$1.00 | \$1.25 | \$1.00 | \$0.40 | \$1.80 | \$275 | \$0.15 | \$0.10 | \$30.00 | \$0.80 | \$53,854.00 |

Club wherein he proposes to put in complete system of water works, piping same from his fresh-water well three miles from the city.

Salt Lake City, Utah.—City Engineer L. C. Kelsey has prepared plans for water main extensions in Fourth Ward; cost \$90,000.

Graham, Va.—Walter Graham, Harrison Bldg., Philadelphia, Pa., will receive bids for extension of water works; improvements will include main pipe line, about 14,000 ft., and installation of pump and boiler.

Enosburg Falls, Vt.—Water and Light Commissioners will install hydrants for fire protection.

Asotin, Wash.—Citizens will vote on \$3,500 bonds for construction of water works.

North Yakima, Wash.—City Engineer Doolittle has estimated cost of establishing water system at \$215,000.

Port Angeles, Wash.—W. W. Seymour, of Tacoma, has been granted a 25-year extension of his water franchise and City Attorney has been instructed to draw up ordinance which will provide for immediate improvement of streets; franchise provides that he will within 30 days begin building water system that will take its supply from Ennis Creek instead of Valley Creek and supply entire city, also Lincoln Heights, which has never had water.

Albany, Wis.—City is considering installing water works.

Kenosha, Wis.—City will construct new water intake; cost \$90,000.

Marshfield, Wis.—Board of Public Works will advertise for bids for construction of an 8-in. water main on North Central ave.

Racine, Wis.—Racine Water Co. is considering extension of system to West Racine.

Shelbourne, Ont., Can.—Ratepayers will vote September 20 on \$6,000 water debentures.—N. B. Allin, Clerk.

BIDS RECEIVED AND CONTRACTS AWARDED

Lamar, Col.—Bids have been opened for Sections 2 and 3 of the proposed water works, and contract for Section 2, which includes 9 miles of 12-in. vitrified pipe line, was awarded to Spicer & Baldwin, of Colorado Springs, for \$29,100; the contract for Section 3, which is for a wood covered concrete reservoir, 12-ft. deep and 230 ft. sq., has been awarded to Manville & Fillon, city, for \$19,500.

New Britain, Conn.—Pierson Engineering & Construction Co. has been awarded contract to build reservoir at Whigville for \$70,160.—P. J. Egan, Clerk Board of Water Commissioners.

Dover, Del.—Council has awarded the T. K. Jones & Bro. Co. contract for laying a 4-in. water main on North Bradford st. from Mary to Cecil sts.

Madison, Fla.—City has awarded contract to H. A. Jaudon, Savannah, for water works system; cost, \$30,000.

Boston, Mass.—Contract for laying 8,100 lin. ft. cast-iron water pipe, bids opened Aug. 16, has been awarded to Charles J. Jacobs Co., 107 Terrace st., Boston.—Dexter Brackett, Chief Engineer Water Works.

Gardner, Mass.—Contract for constructing foundations for standpipe and laying cast-iron water pipe at the Gardner State Colony has been awarded to John E. Palmer, Old South Building, Boston.

North Attleboro, Mass.—Trumbull & Co., of Boston, have been awarded contract for constructing filter beds, at \$28,137.

Spooner, Minn.—Contract for water mains, hydrants and gate valves, bids

opened Aug. 14, has been awarded to William C. Fraser, of Rochester, Minn., for \$2,498.

Elkhorn, Neb.—Contract for constructing water works has been awarded to the National Co., of South Bend, Ind., for \$8,450.—Louis Brickendorfer, Bee Building, Omaha, Engineer.

Binghamton, N. Y.—Bids have been opened by T. E. McGarr, Secretary State Commission in Lunacy, Albany, for extension of water supply system at State Hospital, and the lowest bid was that of R. T. Ford Co., of Rochester, for \$2,441; the lowest bid for steam and return mains and rebuilding trestle at the hospital was that of H. C. Peterson & Co., of Utica, for \$24,738.

Long Island City, N. Y.—Bids were opened as follows Aug. 18 by Commissioner of Water Supply, Gas & Electricity, N. Y. City, for furnishing and connecting 2 pumping engines with steam piping, at Bayside pumping station, Queens Borough: Henry R. Worthington, N. Y. City, \$29,700, and Henry E. Fox, N. Y. City, \$46,000.

New Brighton, S. I., N. Y.—Bids were opened Aug. 18 by Bureau of Water Supply, Gas & Electricity for furnishing, delivering and laying water mains in Bay, Griffin and other streets in Richmond Borough, and the total of bids received were as follows: Clinton Beckwith, Herkimer, N. Y., \$219,663; Daly Bros. Contracting Co., 145th st. and Harlem River, N. Y. City, \$219,881; Joseph Johnson Sons, Staten Island, \$259,357; Rodgers & Hagerty, 41 Park row, N. Y. City, \$220,760; James H. Holmes, Brooklyn, \$218,855; Newman & Carey, Brooklyn, \$218,936; Harlem River Contracting Co., 21 Park row, N. Y. City, \$229,516; McArthur Bros., 7 Pine st., N. Y. City, \$409,487; James King, Brooklyn, \$234,087; Cuzzo & Co., 63 Park row, N. Y. City, \$236,768; Hanover Contracting Co., 215 W. 125th st., N. Y. City, \$212,168.

The unit prices on some of the principal items on the above contract, as submitted by the lowest bidder, the Hanover Contracting Co., of N. Y. City, are as follows: 4,300 tons of straight pipe, \$29.50; 145 tons specials, \$53; 36 tons gate boxes, \$38; 300 cu. yds. rock, 1c.; 2,000 cu. yds. excavation earth, 1c.; 15 lin. ft. 30-in. pipe, \$2; 28,700 lin. ft. 24-in., 80c.; 10,220 lin. ft. 20-in., 60c.; 290 lin. ft. 12-in., 35c.; 3,550 lin. ft. 8-in., 30c.; 2,040 lin. ft. 6-in., 25c.; 20 vaults, complete, \$30.

New York, N. Y.—Bids were opened Aug. 18 by Commissioner of Water Supply, Gas & Electricity for furnishing, delivering and laying water mains in 120th, 160th, 161st, 162d, 163d, 164th, 167th, 168th, 169th, 179th, 207th, 215th sts., and Broadway, as follows: L. D. Gregory, \$38,828; Joseph Grippo, \$42,762; Tuccillo, \$40,848; Wilton Construction Co., \$41,248; Rodgers & Hagerty, \$45,520; Henry E. Fox, \$50,153; Hanover Construction Co., \$45,068; Melrose Construction Co., \$40,343, and F. N. Lewis, \$50,234.

Maud, Okla.—Bids have been opened by the Town Clerk for two gasoline engines, two triplex power pumps, one 30,000 gallon steel tank on steel tower, one mile of 6-in. cast-iron water pipe, with hydrants, valves, etc., and contract awarded to H. S. Lowrey, city.—M. A. Earl & Co., of Muskogee, Engineers.

Sunnyside, Wash.—Bids have been opened for construction of Sulphur Creek Wasteway, near Sunnyside, and the lowest bid was submitted by George Cook & Son, of Minneapolis, Minn., as follows: Schedule 1—12,400 cu. yds. excavation, 25c.; 6,800 lin. ft. laying tile drain, 11 1/2-c.; 2,000 cu. yds. concrete, \$9.47; total for Schedule 1, \$22,811. Schedule 2—400 cu. yds. excavation, class A, 60c.; 375 cu. yds. excavation, class B, \$1.20; 5 M ft. sheet piling and lumber in

place, \$50; 106 cu. yds. concrete, \$14.60; 67 cu. yds. paving, class A, \$7.50; 63 cu. yds. paving, class B, \$7.10; total for Schedule 2, \$3,437. Total of both schedules, \$26,248. Totals of other bids on both schedules: Strange & McGuire, Salt Lake City, Utah, \$28,317; Chamberlin Construction Co., Seattle, Wash., \$31,547; International Contracting Co., Seattle, Wash., \$37,507, and J. M. Bruce & Co., Seattle, Wash., \$30,492.

LIGHTING AND POWER

Dothan, Ala.—Citizens have voted \$6,000 bonds for extension of electric light plant.

Monette, Ark.—Council has granted electric lighting franchise to Monette Lumber Co.

Nashville, Ark.—Permanent survey has been completed for power dam to be erected on the Little Missouri River by ex-Gov. Dan W. Jones and associates; construction work will begin soon; dam will be 60 ft. high and two miles long, and the basin will cover 1,000 or 1,200 acres; minimum power will be 10,000 hp. and the maximum 55,000.

Globe, Ariz.—Council has been petitioned by A. H. Stern for franchise to construct street railway.

Chico, Cal.—Pacific Gas & Electric Co. is planning to construct more electric power plants in this part of State.—William Durbrow, Berkeley, Engineer.

Elsinore, Cal.—Consolidated Reservoir & Power Co. is preparing to construct large dykes across Elsinore Lake and utilize water for power and irrigation purposes.—Edwin Moore, Los Angeles, President.

Monrovia, Cal.—Committee appointed to investigate advisability of installing new lighting system for Myrtle ave. has estimated cost of installation at \$1,300.—Fred Goodsell, Chairman.

Stanwood, Cal.—The Pacific Gas & Electric Co. will erect a large power plant.

Castle Rock, Col.—Town is considering the erection of steam-driven electric light station; will also install equipment for an ice manufacturing plant in connection with the electric plant.

Hugo, Col.—Town has granted Hugo Water, Light & Power Co. 20-year franchise to furnish town with electricity and water; cost \$70,000.

New Haven, Conn.—Jas. English, President of United Illumination Co., has made a proposition to Council to install new light system; cost \$50,000.

Dover, Del.—Council has ordered all telegraph and telephone companies to place wires and conduits underground before sewer system is completed.

Atlanta, Ga.—Joint Committee from General Council has recommended the installation of 50 incandescent lights of 50 c.p. each in Grant Park.

Atlanta, Ga.—Georgia Power Co. has been given authority by Railroad Commission to issue \$1,550,000 worth of bonds and same amount of stock; concern will develop water powers of the Chattahoochee and Etowah rivers.

Collegepark, Ga.—City has appointed Committee, C. A. Wickersham, Chairman, to investigate advisability of installing electric light plant.

Douglasville, Ga.—City has issued \$10,000 bonds for improvements to the municipal electric light plant.

Senola, Ga.—Citizens will vote September 11 on \$10,000 bonds for electric light plant.

Cartersville, Ill.—Interurban Electric Co. has been incorporated with a capital of \$150,000 to operate an electric light, heat and power plant.—F. W. Richart, E. E.

Denison and H. B. Cassel, Incorporators. Christopher, Ill.—Local Council has granted H. M. Rea, of the Light, Heat & Power Co., franchise for an electric light plant.

Monmouth, Ill.—Searles Power Co. has secured franchise to construct a gas plant.

Rockdale, Ill.—Village has granted Western United Gas & Electric Co. 50-year franchise.—H. J. Mitchell, Joliet, Manager.

Chesterton, Ind.—Town Board has granted a 25-year franchise to Northern Indiana Gas & Electric Co.—Clarence H. Geist, President.

Hammond, Ind.—United States Steel Corporation, by subsidiary corporation, is to ask Council for franchise to supply this region with light and heat.

Huntington, Ind.—City has received a petition from B. F. Burke, Marion, for franchise for electric light, heat and power plant.

Marion, Ind.—Council will soon ask for bids for new equipment for municipal electric light plant.

Portland, Ind.—Citizens will decide whether they wish to install an electric light plant or whether they wish contract with Bunce Co., which runs out next May, renewed.

Boone, Ia.—Citizens have voted to grant E. B. Hughes and associates franchise for a heating and electric light plant.

Ft. Leavenworth, Kan.—Contract was not let for extending and making certain changes in the electric lighting system and fire alarm system.—Wm. D. Davis, Captain Q. M.

Topeka, Kan.—Councilman Howard has introduced resolution which proposed that the Electric Light Commission be asked to give estimate in regard to what it would cost the city per kilowatt to furnish electric power for commercial purposes.

Guthrie, Ky.—Guthrie Light & Power Co. will install electric plant for purpose of supplying electricity in this city, Trenton, Pembroke, Elkton and Allensville; company will purchase second-hand 180 to 200-kw., three-phase, 60-cycle, 2,200-volt, alternating-current generator.—G. Ragsdale can be addressed.

Alexandria, La.—Citizens have voted \$40,000 for extension of electric light and water works plant.

Waterville, Me.—Messalonskee Electric Co., city, will soon ask for bids for construction of new electrical power house, which will be erected on the Messalonskee stream at Rice's Rips; dam will be about 20 ft. in height and will be of reinforced concrete; power house will be of brick.

Turner's Falls, Mass.—Franklin Electric Light Co. will establish independent plant to supply electricity.

Lake City, Minn.—City will install this year, electric light plant, 100-kw., turbine, 3-phase.

Pine River, Minn.—Company, composed of C. H. Smith, Duluth; B. E. Wideman, and E. L. Forbes, city, will apply for franchise to establish electric lighting plant; water of Norway Brook will be utilized.

Brandon, Miss.—Brandon Lumber Co. will install electric lights.

Greenwood, Miss.—Greenwood Water and Light Plant has decided to install gas works.

Lathrop, Mo.—Citizens will vote on \$7,500 electric light bonds.

Pattonsburg, Mo.—Plans have been completed for construction of an electric light plant; transmission lines will be erected from Trenton to this city, via Gallatin and Jamesport.—Edgar B. Evely is interested.

Lodge Pole, Neb.—City is considering establishment of electric light plant.

Omaha, Neb.—Local Street Railway Co. will spend \$30,000 on improvement of power house, including the installation of large dynamos and other machinery.

Valley, Neb.—Citizens have voted \$17,000 bonds to establish an electric light plant and water works system.

Albany, N. Y.—Public Service Commission has authorized Deer River Power Co. to exercise franchises in the village of Copenhagen, Lewis county, and to issue its capital stock to the amount of \$25,000, to be used for the purposes of expense of organization and paying its indebtedness incurred in purchase of certain water power, riparian rights and land at High Falls on Deer River.

Asheville, N. C.—Judge Pritchard has signed decree confirming sale of the Rockingham Power Co.'s plant to the reorganization committee for \$1,000,000; committee is composed of Eastern capitalists, who will at once complete the building of great hydro-electric plant on the Yadkin River.

Saxapahaw, N. C.—J. W. Menefee and associates will form company to install water power-electric plant.

Inkster, N. D.—City is considering installation of electric light plant.

Garrettsville, O.—Bruce, Fisher & Tuttle will install new engine and dynamo at electric light plant.

Girard, O.—Youngstown Consolidated Gas & Electric Co. is planning to extend and improve system if certain concessions are granted.

McArthur, O.—Council is considering installation of a gas engine about 60-hp., direct-connected to a 220-volt generator.

Guthrie, Okla.—Manager W. J. Dibbens, of local gas company, has filed proposition with Council to light streets with gas; gas arc lights on 15-ft. poles will be installed.

Mangum, Okla.—Citizens have voted to cancel old Mangum Light & Power Co.'s franchise and grant new one for 25 years which will enable the sale of bonds to the extent of \$100,000.

Taloga, Okla.—Citizens have voted bonds for installation of an electric light plant.

Portland, Ore.—Rose City Park Improvement Association is considering plans for lighting Sandy road; lamps will be installed from 28th st. to the city limits at once.

Woonsocket, S. D.—Citizens are considering installation of electric light plant.

Crosbyton, Tex.—P. L. Coonley, J. S. Coonley and E. P. Bailey, Chicago, Ill., are planning development of Silver Falls water power and construction of plant for transmitting electricity.

Paducah, Tex.—City is considering establishment of electric light plant.—W. H. Winton, Secretary Commercial Club, is interested.

Martinsville, Va.—Plans are being considered for enlarging dam and increasing output of municipal electric light plant.

Portsmouth, Va.—Local Board of Improvements will install arc lights in Sixth Ward.

Friday Harbor, Wash.—Western Mills & Lumber Co. has been granted a light franchise.

Seattle, Wash.—Council has passed ordinance providing for installation of cluster lamps on seven streets.

De Pere, Wis.—De Pere Electric Co. will change its system from direct to alternating current; cost \$10,000.

Kenosha, Wis.—The W. J. McClurg Gas Construction Co. has asked for franchise for a plant and guarantees 90c gas.

Calgary, Alta., Can.—Smith, Kerry & Chace, Toronto, Ont., have completed plans and contracts will soon be awarded for construction of the main dam, headworks, power house, retaining walls, erection of steel racks, penstocks, sluice gates and other work necessary for the plant of the Calgary Power & Transmission Co.

BIDS RECEIVED AND CONTRACTS AWARDED

Rockville, Ind.—Bids have been opened by Henry Moore, President Commissioners of Tuberculosis Hospital Commission, Indianapolis, Aug. 18, for electric work at proposed hospital and contract has been awarded to the Sanborn-Marsh Electric Co., 116 North Illinois st., Indianapolis, for \$8,241.

Cedar Rapids, Ia.—Contracts have been awarded by Cedar Rapids & Iowa City Railway & Light Co. for improvements to its power house in Cedar Rapids, aggregating \$125,000.—H. M. Bylesby & Co., of Chicago, Ill., Consulting Engineers.

Boston, Mass.—Superintendent of Streets Emerson announced that he had closed all negotiations with the Rising Sun Street Lighting Co. for the extension of the company's contract until Feb. 1 for lighting the city's side streets and parks by gas. The Rising Sun company's contract, which has been in existence for the past year, expires September 15, and through arrangements perfected by Superintendent Emerson, after being informed that he could not legally make a new contract for street lighting beyond February 1, the Rising Sun company will continue the service. The company, under the new agreement, will light the city's 12,000 gas lamps for the next few months at the rate of \$23.60 per year for each lamp.

Boston, Mass.—Contract for construction of new \$1,000,000 plant of Plymouth County Gas Co. has been awarded to Western Gas Construction Co., Fort, Wayne, Ind.; work will be commenced at once.

Westfield, Mass.—Contract for putting in condensing pipe with installation of addition to power plant has been let to Daniel Dorey.

Hawley, Minn.—Bids were opened Aug. 13 for electric light and water works plant, to include brick or concrete building, 50,000 gallon steel tank and tower or air compressor tank and concrete reservoir, distributing pipe line system, dynamo, switchboard and pole line wiring; also pumping plant, from plans of Oscar Clausen, of St. Paul, and contract has been awarded to Fairbanks, Morse & Co., of St. Paul, for \$13,750.

Haddonfield, N. J.—Borough Council has accepted plans for enlargement of its power house; original plans were inadequate and new plans were drawn up by Wilbur Beau-

ment, who has the contract for building power plant.

Niagara Falls, N. Y.—J. A. Bard, Buffalo, has submitted lowest bid on four-way duct for transmission of electricity from Schoellkopf Power House to proposed station of new water works on upper river, for \$12,700.

West Point, N. Y.—Following bids have been received by Major J. M. Carson, Jr., Q. M., West Point, for furnishing and installing electric light and gas fixtures in double officers' quarters No. 10, 11, 12, 13, and in lieutenants' quarters No. 5, etc.: The Enos Co., 36 West 37th st., New York, \$5,071; Wahle, Phillips Co., 549 West 52d st., New York, \$5,994; E. P. Gleason Mfg. Co., 37 Murray st., New York, \$6,718; Fritz Storsberg, 20 Atlantic st., Newark, N. J., \$7,639; L. Perelson, Inc., 202 Centre st., New York, \$6,261; Horn & Brannen Mfg. Co., 427 North Broad st., Philadelphia, \$5,755; The Reading Chandelier Works, Reading, Pa., \$4,768; the Mitchell Vance Co., 836 Broadway, New York, \$5,527; Cassidy & Son Mfg. Co., 133 West 23d st., New York, \$5,122.

Grand Forks, N. D.—City has let contract for 132 ornamental posts and lights for \$29,561.

Cleveland, O.—Board of Control and Board of Public Service have awarded contract for new boiler and stoker for municipal lighting plant to the Babcock & Wilcox Co., New York, N. Y., for \$7,612.

Philadelphia, Pa.—John R. Wiggins, 1215 Filbert st., has secured contract to build a one-story brick power house on the west side of Kensington ave., for Philadelphia Electric Co., for about \$18,000.

Chattanooga, Tenn.—Ambursen Hydraulic Construction Co., Boston, Mass., has secured contract from the Carolina-Tennessee Power Co. for its proposed power plant on Hiwassee River.

Bremerton, Wash.—Contract for furnishing and installing power plant equipment, to include piping, pumps, condensers, heaters, etc., at the Navy Yard, Puget Sound, has been awarded to the D'Olier Engineering Co., of Philadelphia, Pa., at \$57,950.

Seattle, Wash.—Bids for pole line extensions, including poles and cross arms, were opened by Board of Public Works, after specifications had been changed slightly and the original bids rejected. These districts, with the low bid in each, are as follows:

District 1, West Seattle: A. Forester Deveraux, \$17,253.31.

District 2, Rainier Beach and all of the 12th Ward: A. Forester Deveraux, \$26,951.59.

District 3, extending from Hanford st. to Yesler Way, between the bay and the lake: A. Forester Deveraux, \$14,065.10.

District 4, extending from Yesler Way to Denny Way, between Sound and lake: Pacific Engineering Co., \$11,338.16.

District 5, that territory west of Westlake ave., south of the canal and north of Denny Way: Pacific Engineering Co., \$10,079.96.

District 6, that territory north of Denny Way, east of Westlake ave. and south of the canal: Charles F. McDonald, \$7,406.75.

District 7, that territory east of Meridian ave. and north of the canal to the city limits: Charles F. McDonald, \$8,863.45.

District 8, extending between Meridian ave. and 14th ave. Northwest and north of the canal to the city limits: Charles F. McDonald, \$15,268.39.

District 9, that territory west of 14th ave. Northwest, including all of Ballard, \$10,635.70.

Toronto, Ont., Can.—Contracts for construction of 8 transformer stations have been awarded by Hydro-Electric Power Commission. Contract for constructing the stations at St. Mary's, Stratford, Berlin and Guelph, was awarded to Edge & Gutteridge, of Seaford, at \$18,000 each; the buildings at Preston, Paris, Woodstock and St. Thomas, to John Hayman & Son, of London, at \$19,850 each.

FIRE EQUIPMENT

Tucson, Ariz.—Fire Department will purchase badges and caps.

Anderson, Cal.—Citizens will vote on special tax, \$550, to purchase fire-fighting apparatus.

Napa, Cal.—Bids have been advertised for furnishing fire department with 40-hp. automobile chemical engine.

San Pedro, Cal.—City is considering purchase of auto chemical engine; cost \$4,750.

Pueblo, Col.—City is considering purchase of automobile for fire chief.

Thompsonville, Conn.—Fire Committee has ordered extension of fire alarm system and installation of hydrants.

Washington, D. C.—Fire Chief Samuelson, Manila, P. I., will ask War Department for permission to buy automobiles for use in that city of American manufacture.

Washington, D. C.—Park View section will receive fire protection.

Dalton, Ga.—Fire Department is considering repair of hook and ladder truck.

Boise, Ida.—City is considering need of more hose.

Bloomington, Ill.—Purchase of fire engine is being considered.

Pekin, Ill.—City is considering purchase of more apparatus.

Philo, Ill.—About 1,500 ft. of new fire hose will be purchased.

Rock Island, Ill.—Council has decided to purchase about 1,000 ft. of fire hose.

Sydney, Ill.—Village has voted \$1,000 bonds for purchase of hose.

Muscantine, Ia.—Citizens have raised \$2,000 toward purchase of auto hose truck.

Ft. Leavenworth, Kan.—Contract was not let for extending and making certain changes in the fire alarm system.

Girard, Kan.—Council has decided to purchase 1,000 ft. of hose.

Iola, Kan.—City will erect new fire station.

Covington, Ky.—Citizens of Latonia District are urging better fire protection.

New Orleans, La.—Site near City Park will be secured for proposed engine house.

Baltimore, Md.—Fire Board will ask an appropriation to install fire alarms in all hospitals and institutions in which infirm or helpless people are housed.

Hopedale, Mass.—Town has appropriated \$5,000 for an auto truck of latest pattern.

Ipswich, Mass.—City is considering purchase of fire boat.

Lunenburg, Mass.—Town has voted \$450 for hand extinguishers.

Springfield, Mass.—Council has passed recommendation of Fire Commissioners to issue \$90,000 bonds for headquarters building in Dwight st. and \$20,000 for station on Margaret st.

Taunton, Mass.—Aldermen will probably consider order for new steamer for Bay st. fire station.

St. Joseph, Mo.—Architects Eckel & Boschen have prepared plans for a \$5,500 fire station.

Roundup, Mont.—Town will organize a volunteer fire department.

Townsend, Mont.—Council has decided to purchase 500 ft. of hose.

Rochester, N. H.—Council will soon be asked to purchase a steamer for fire department.

Akron, O.—Hayden-Miller Co. has secured \$8,500 fire engine bonds at \$103 premium.

Dayton, O.—Belmont Improvement Association is considering establishment of fire apparatus.—Lemuel Hagerman, Chairman, Committee.

Elyria, O.—City is considering purchase of another engine and installation of fire alarm system.

El Reno, Okla.—Plans have been prepared by Architect J. W. Vogel for erection of two fire stations; cost \$20,000.

Hazleton, Pa.—Council is considering erection of a two-story addition to Diamond Fire House.

New Brighton, Pa.—Town will purchase a hook and ladder truck.

Scranton, Pa.—Mayor Von Bergen has signed ordinance authorizing Fire Chief Ferber to ascertain cost of an automobile.

Southampton, Pa.—Fire company is being organized; second-hand suction engine will be purchased.—O. Meyer.

South Bethlehem, Pa.—Chairman Kleckner of Fire Committee will secure bids for about 5,000 ft. of hose.

Cuero, Tex.—City will soon install an electric fire alarm system.

Paris, Tex.—Plans have been completed by Barry & Smith for fire station.

Norfolk, Va.—Property owners of Ocean View and Willoughby Beach are urging better fire protection; engine house will be built and fire company organized.

Wenatchee, Wash.—Chief Throw is urging purchase of a hose and ladder truck.

Ashland, Wis.—Council has advertised for 2,000 ft. of new hose.

BIDS RECEIVED AND CONTRACTS AWARDED

Baltimore, Md.—James Farley has been awarded contract to construct Fire Engine House No. 34, at Caroline and Bank sts., by the Board of Awards; his bid was \$21,000.

Camden, N. J.—Fire Committee of City Council has opened bids for erection of new fire house at Kaighn and Mt. Ephraim avenues. The bids opened were as follows: R. Tait, \$13,821; Charles N. Shuster, \$13,500; W. Wifford, \$12,600; C. H. Sharp, \$11,409; James W. Draper, \$11,383; George Bachman, \$12,335; Turner & Stewart, \$12,298; Larsen Construction Company, \$10,595. Latter bid was rejected and the contract was awarded to James W. Draper. Committee also opened bids for a second-class fire engine and combination hose carriage. The bids were as follows: Amoskeag Fire Engine Company, \$5,500; American La France Fire Apparatus Company, \$5,500. Contract was awarded to the American La France Apparatus company.

Bids for the combination hose carriage were as follows: Accurate Chemical Fire Apparatus Company, \$1,599; James Body & Bro., \$1,350; Robbins Fire Company, \$1,424; American La France Fire Apparatus, \$2,222; Combination Ladder Company, \$2,222.

ELECTRIC RAILWAYS

Eureka, Cal.—W. S. Clark and E. E. Skinner are interested in construction of an electric road from this city to Redding.

San Bernardino, Cal.—Council is considering granting of franchise to build electric railway to extend from 3d st. and E st. north to 6th st., west to Mt. Vernon st. and north to Base Line.

Columbia, Ga.—Council has received applications for franchises for a street railway from A. H. Brown and W. B. Turner.

Macon, Ga.—J. W. McFarland will ask for franchise for street railway.

Savannah, Ga.—Savannah Lighting Co. will construct a line to Tybee Island and other points.

Ashmore, Ill.—Mattoon Street Railway Co. will build new line from Charleston to Paris and from Ashmore to Westfield.

Chenoa, Ill.—Council has granted Bloomington, Pontiac and Joliet electric road a 50-year franchise.

Crescent City, Ill.—Danville, Kankakee & Crescent Traction Co. has completed survey of its interurban railway and is securing right-of-way between Kankakee, Danville and this city.—J. P. Sterrenberg is interested.

Evansville, Ind.—Evansville, Suburban & Newburg Traction Co. is planning to extend its lines into Kentucky and will build to Henderson and Uniontown, Ky.

Fort Wayne, Ind.—Allen County Commissioners will be asked for franchise for new Fort Wayne-Bryan, O., electric line.—H. W. Somers, Attorney.

Kokomo, Ind.—County Commissioners have granted C. C. McFann franchise to construct a railway from this city to Young America.

Madison, Ind.—County Commissioners have called election for September 28 in Madison, Republican and Hanover townships on the granting of a subsidy of \$67,000 for Cincinnati, Madison & Westernburg via Hanover and North Madison to Madison.

Michigan City, Ind.—Council has granted Chicago, Lake Shore & South Bend Railway Co. an extension of its franchise until September, 1910, in which to complete its proposed branch into this city.—H. V. Wallace, General Manager.

Burlington, Ia.—Local Street Car Co. will double-track line from 4th to Corse sts.

Oskaloosa, Ia.—Plans are being prepared for construction of interurban railway from this city to Barnes City, Montezuma, Malcolm and Tama; cost \$15,000 per mile.

Altamont, Kan.—Kansas Union Traction Co. has made citizens of Columbus offer to build electric railway from Cherryvale through Oswego to Columbus, provided they would raise bonus of about \$6,000; company will construct interurban railway connecting Parsons, Cherryvale, Altamont, Mound Valley, Edna and Coffeyville.—W. J. Jones, General Manager.

Edna, Kan.—Council has granted franchise to Kansas Union Traction Co. to build its proposed electric railway through this city.

Baltimore, Md.—United Railways & Electric Co. has prepared tentative plans for introduction of pay-as-you-enter cars on some of its lines, and if experiment proves successful their use will be extended to other lines of the system.

Haverhill, Mass.—Governor's Island Co. has been incorporated to develop island at Island Bay, N. H., and capital has been paid over for Hempstead & Haverhill Electric Co.; company will construct lines connecting Manchester, Derry and other New Hampshire points with local beach lines; line will also be built to Governor's Island. A. M. Emerson, Hempstead, President, and A. A. McReel, Exeter, Secretary.

Kalamazoo, Mich.—Michigan United Railways has applied to Council for franchise to build line on South Rose st.

Marquette, Mich.—Proposed interurban electric railway from this city to Ishpeming is about financed.

Minneapolis, Minn.—Electric Shortline proposes to build line from this city to Winstead via Medicine Lake and Watertown.

Mansfield, Mo.—L. O. Nelder, city, is interested in construction of an 8-mile interurban electric railway from this city to Ava.

South Amboy, N. J.—Council has passed first reading ordinance granting franchise to Jersey Traction Co. for rights-of-way through certain streets.

Elmira, N. Y.—Committee of Whole has practically agreed on terms for granting franchise to Elmira Water, Light & Railroad Co. to extend Maple ave. line to city limits.

Jamestown, N. Y.—Construction of trolley extensions connecting this city with Salamanca, Little Valley and Olean is proposed; plans provide for an extension of Jamestown street railway system to Randolph. The Sheehan-Mayer syndicate will then build a line from Little Valley to Randolph by way of Salamanca.

Oswego, N. Y.—Town Board has granted the Beebe syndicate franchise to run its new trolley system from Fulton to this city through town.

Henderson, N. C.—City has granted H. S. Anderson franchise to build a street railway.

Highpoint, N. C.—North Carolina Public Service Co. will install car line soon.

Cadiz, O.—Council has received application from Wheeling, Cadiz & Tuscarawas Traction Co. for franchise to construct an electric railway over certain streets and avenues.—A. E. Townsend, Cadiz, General Manager.

Dayton, O.—Dayton Street Railway Co. is considering several extensions.

Findlay, O.—Toledo, Bowling Green & Southern Railway is planning to extend its electric railway to Kenton very soon.

Shelby, O.—Electric line will be built into this city, thence to Bucyrus via Tiro and Sulphur Springs.—Address Mr. Bartholomew, President B. N. & M.

Zanesville, O.—Business men of this city and Markle are considering construction of traction line; road projected will include Fort Wayne, Zanesville, Markle, Warren, Marion, Elwood, Noblesville and Indianapolis.—Attorney Eben Lesh is interested.

Eugene, Ore.—Eugene-Pacific Western Railroad has been incorporated to take over the property, franchises and rights of Eugene-Pacific Electric Railway, which proposed to build electric railway from Eugene to Florence; distance 40 miles.—F. J. Bergot, Joseph Fellman and F. A. Anderson, Incorporators.

Forest Grove, Ore.—Council has been petitioned by United Railways Co. for franchise to construct extension of its system.

Florence, S. C.—J. L. Barringer, P. A. Willcox, William J. Brown and S. S. Ingman have applied for an electric street railway franchise.

Pierre, S. D.—The Iowa Light & Traction Co. has been incorporated to construct electric railway from Boone to Ogden, Ia., and later to Story City, Webster City, Ames and Perry.

Knoxville, Tenn.—Council is considering ordinance granting Chas. Dewes franchise to construct electric line on three avenues.

Lebanon, Tenn.—City has granted H. B. Bond 99-year franchise to construct and operate street railway.

Memphis, Tenn.—Clarksdale, Covington & Colliarsville Interurban Co. and Lakeview Traction Co. have asked city to grant franchise for new route; crosstown lines are included.

Memphis, Tenn.—Lake View Traction Co. will build an extension to Collierville, Tenn.—R. F. Tate, North Memphis Savings Bank Bldg., President.

Stamford, Tex.—Council has granted B. E. Sparks and associates franchise over the streets for street railway company; franchise gives the privilege of all streets of the city for 50 years and provides that the work begin within two years.

Wichita Falls, Tex.—The Wichita Falls Traction Co. has been incorporated to build electric railway from Wichita Falls to Lake Wichita; distance 5 miles.—J. A. Kemp, Frank Krell, Chas. C. Huff and F. P. St. Clair, Incorporators.

Willard, Utah.—Utah Hot Springs line will be extended to Brigham.

Richmond, Va.—City has granted People's Improvement Co. franchise giving it the right to use necessary streets for extension of the Diamond Hill car tracks to Fairview Heights.

Monroe, Wash.—Council has received application from Everett & Cherry Valley Traction Co. for permission to build temporary track over certain streets of Monroe to connect the Snoqualmie Valley Railway with the main line of the Great Northern Railway.

Spokane, Wash.—Spokane, Walla Walla & Western Railroad, recently incorporated with E. M. Symonds, city, President, has taken over all the franchises, rights-of-way and surveys of the Columbia River & Walla Walla Traction Co., including franchises in Walla Walla, Wallula, Dayton and other towns; route of electric line which company proposes to build runs from Wallula, Wash., eastward to Touchet, thence to Freewater, Ore., and northeast to Walla Walla, Waitsburg and Dayton, connecting with Inland Empire Electric system either at Penawawa, on Snake River, or at Colfax for service to Spokane; electricity is to be generated by water power plant 18 miles east of Dayton.

Wausau, Wis.—Local Street Railway Co. will extend its electric railway one mile south of Schofield; also north to Merrill.

BIDS RECEIVED AND CONTRACTS AWARDED

Lexington, Ky.—Smethurst, Allen & Co., the Philadelphia General Contractors, have secured contract for electrical work on Shelbyville extension of the Louisville & Eastern Electric line.

BRIDGES

Selma, Ala.—Dallas County Commissioners are considering employment of a civil engineer to aid them in location and proper construction of bridges and in road building.

Bentonville, Ark.—Northwest Arkansas Electric Interurban Railway will erect four small bridges on route from Bentonville to Joplin, Mo.—P. H. Sackett, Chief Engineer.

Tishomingo, Ark.—Citizens have voted \$100,000 bridge and road bonds.

Napa, Cal.—Citizens have voted \$15,000 bonds to build 120-ft. concrete and reinforced concrete bridge across 1st st.

Boise, Ida.—County Commissioners have decided to erect a \$1,000 foot bridge.

Decatur, Ill.—Plans are being considered for construction of steel bridge near Oakley.

Streator, Ill.—Bridge Committee, W. W. Fair, Chairman, has recommended that new bridge be erected on Plumb st. and raised about 3 ft. higher than present bridge.

Streator, Ill.—Citizens will vote September 18 on \$40,000 bonds to replace river bridge on Bridge st. with modern structure.

Knoxville, Ia.—County Commissioners have appropriated \$10,000 to rebuild bridge between this city and Pella.

Jeffersonville, Ky.—Clark County Commissioners have asked a \$6,750 appropriation for new bridges and one of \$3,000 for repairs.

Paris, Ky.—New steel bridges are to be built over entire system of the Frankfort & Cincinnati Railroad.

Waterville, Me.—Board of Municipal Officers has granted permission to Lewiston, Augusta & Waterville Street Railway to cross the Kennebec River on a concrete bridge to be built near present Ticonic bridge.—H. B. Ivers, General Manager.

Northampton, Mass.—Council has voted to expend \$3,000 in repairs to Connecticut River bridge.

Eaton Rapids, Mich.—Citizens have voted to replace old bridge over Thornapple River with a new steel bridge.

Wyandotte, Mich.—City is considering construction of new bridge; plans have been prepared.

Grand Rapids, Minn.—Bids will be received September 9, 1:30 p. m., for \$6,500 bridge and road bonds.—J. H. McMahon, Town Clerk.

Grenada, Miss.—Board of Supervisors will receive bids in September for construction of four bridges.

Rockport, Miss.—Board of Supervisors has rejected bids for construction of proposed steel bridge across Pearl River.

Nashua, N. H.—Committee, Mayor Albert Shedd, Chairman, has been appointed to secure estimate on cost of repairing Taylor Falls bridge; also cost of constructing entirely new structure.

Paterson, N. J.—Board of Freeholders has ordered painting of 30 bridges.

Paterson, N. J.—Manchester Township Bridge and Culvert Committee will solicit bids for culvert at Goffle road and North 8th st.

Trenton, N. J.—Council will consider rebuilding of bridge over water power at Willow st.

Niagara Falls, N. Y.—The Grade Crossing Commission is urging construction of new bridge over Central tracks at 11th st.—R. A. McClanathan, City Engineer.

Syracuse, N. Y.—Plans are being prepared for bridge to be constructed over Erie Canal at Franklin ave; cost about \$51,000.

Fayetteville, N. C.—County Commissioners have sold \$25,000 bonds for construction of steel bridge over Cape Fear River.

Cleveland, O.—Cuyahoga County has awarded \$17,316 Murphy bridge and road bonds to Western German Bank at \$576 premium.

Elyria, O.—Board of Service will at once construct bridge in Cascade Park.

Curtis, Okla.—County Commissioners have decided to construct steel bridge over Canadian River.

Milburn, Okla.—Johnson County has voted a bridge bond issue.

Pawhuska, Okla.—Osage County has voted \$450,000 bridge, jail and Court House bonds.

Pawnee, Okla.—Pawnee County Commissioners are considering a \$175,000 bridge bond issue.

Sapulpa, Okla.—Creek County will vote October 26 on \$200,000 bonds for construction of 60 bridges.—W. O. Baker, Chairman County Commissioners, Bristow.

Woodward, Okla.—County Commissioners will construct steel bridge across the Canadian River south of Curtis.

Ashland, Ore.—City will erect bridge over gulch on Henry st.

Eugene, Ore.—County Commissioners are considering building of a large bridge outside of this city.

Portland, Ore.—Oregon Railroad & Navigation Co. has completed plans for viaduct to be constructed across Willamette River from Gilsan to Oregon sts; cost about \$1,300,000.—G. T. Forsyth, Bridge Engineer.

Butler, Pa.—County Commissioners and Pittsburgh, Harmony, Butler & New Castle Railway Co. are considering construction of new bridge across Beaver River.

Chester, Pa.—Delaware County Commissioners have decided to make extensive repairs to bridge over Chester Creek at 9th st.

Pawtucket, R. I.—City is considering construction of bridge at North Main st.; cost about \$5,000.

Knoxville, Tenn.—Council is considering construction of bridge across First Creek.

Aspermont, Tex.—Stonewall County Commissioners have not yet selected plans for bridge construction.—Ernest Herring, County Judge.

Corpus Christi, Tex.—Nueces County will vote September 11 on \$10,000 bonds for bridges.

Houston, Tex.—City is considering construction of bridge across ship channel to replace San Jacinto st. bridge.—F. L. Dorman, City Engineer.

Brigham, Utah.—Board of County Commissioners is considering repair of a number of bridges around city.

Olympia, Wash.—All bids received for construction of the Winthrop bridge across Methow River have been rejected on account of the substitution of a 75-ft. for a 125-ft. span, and new bids will be called.—H. L. Bowlby, Highway Commissioner.

Seattle, Wash.—House has passed viaduct bill enabling city to build bridge over tide flats.

Spokane, Wash.—City has approved plans prepared by City Engineer J. C. Ralston for construction of a new bridge at Monroe st.

Brideport, W. Va.—Bridge will be erected over Wheeling Creek.

Milwaukee, Wis.—Council Bridge and Viaduct Committee has recommended construction of stationary concrete bridges over the Kinnickinnic River at Chicago and at 1st ave.; cost \$7,000 and \$10,000 respectively.

Duhamel, Alta., Can.—The Grand Trunk Pacific Railway Co. has had plans prepared for a bridge 3,000 ft. long and 100 ft. high.

Toronto, Ont., Can.—Board of Railway Commissioners have decided to construct high level bridge at Queen st.; cost about \$200,000.

BIDS RECEIVED AND CONTRACTS AWARDED

Pine Bluff, Ark.—County Judge James Gould has let contract for erection of large steel bridge across Bayou Meto, near Keydel, this county; work will begin immediately on the bridge, which must be completed by January 1. There were two bidders, the contract being awarded to the Pennsylvania Bridge Co. of Texas, which submitted a bid aggregating \$3,332.12.

Middletown, Conn.—Selectmen opened the second set of bids for the contract of building abutments under the proposed new bridge over Sumner Creek, August 26. Bids were but little lower than those of ten days ago, which were rejected. Roger Kennedy was lowest bidder at \$2,116. The only other bid was from Kennedy & Arrington and was for \$2,294.

Columbus, Ga.—Southern Bridge Co., of Birmingham, has been awarded contract by Muscogee and Talbot Counties to build steel bridge across Baker Creek.

Belleville, Ill.—Gass Brothers, city, were successful bidders at bridge letting of Freeburg Township and Road and Bridge Committee of County Board of Supervisors; they offered to construct reinforced concrete bridge over Heberer branch on the Freeburg-Mascoutah road and a similar structure over Paule Creek on Belleville-Jefferson road for a total of \$2,179.75, with an extra charge of \$7.50 per cu. yd. for any additional concrete masonry needed. Other three bidders were considerably higher, their figures being as follows: Joseph Klein, of Freeburg, \$3,000; the Missouri Bridge & Iron Co., of St. Louis, \$3,860; Stupp Bros., of St. Louis, \$4,015.

Green Valle, Ill.—Contract to construct a 200-ft. steel bridge over Mackinaw River, at Keefer's Ford, in Dillon Township, has been awarded to Wm. Noonan Concrete Co. at \$7,089.

Joliet, Ill.—Newkirk & Powers have been awarded contract for construction of a bridge over Spring Creek at Cass st.; structure will cost \$5,240 and is to be completed within six weeks.

Pella, Ia.—Iowa Bridge Co., Des Moines, has been awarded contract for rebuilding old Pella bridge over the Des Moines River; estimated cost, \$10,000.

Concordia, Kan.—Canton Bridge Co., Canton, O., has secured contract for constructing three bridges, two of 30 ft. and one of 40 ft.

Fort Leavenworth, Kan.—Kansas City Western R. R. Co. has awarded contract for constructing steel and concrete viaduct over Two-Mile Creek to the Leavenworth Bridge Co., Leavenworth, at about \$20,000.

Larned, Kan.—Contract for constructing an 80-ft. reinforced concrete arch bridge over Pawnee River on S. Main St. has been awarded to Topeka Bridge & Iron Co., Topeka, for \$5,200.

High Bridge, Ky.—Cincinnati, New Orleans & Texas Pacific R. R. has awarded the contract of \$125,000 to Oliver Bros. & Huncutt, of Knoxville, to remove 200,000 cu. yd. of earth in preparation for the construction of a new bridge over the Kentucky River.

New Orleans, La.—City has awarded contract at \$18,000 to Pen Bridge Co., Beaver Falls, Pa., for rebuilding the bascule bridge across Bayou St. John.

Bangor, Me.—All bids opened, Aug. 2, for repairs and reinforcements of foundations of bridge across Penobscot River have been rejected.

Rumford, Me.—Following are the bids opened, Aug. 17, by Board of Selectmen for constructing steel superstructure of a bridge over Androscoggin River: Pennsylvania Steel Co., Pittsburg, \$61,865; Penn. Bridge Co., Beaver Falls, Pa.

Towson, Md.—McNaul & Drury, York, Pa., have secured contract at \$10,688 for constructing reinforced-concrete arch for county. Two 50-ft. span arches, 24 ft. in clear, including 4-ft. sidewalk between railways, wings, complete, ready for use, 110-ft. retaining wall, about 8 ft. high, and 4,200 cu. yd. of filling.

Boston, Mass.—Bridge across Quabog River at Palmer and Monson will be constructed of stone masonry rather than of concrete. Highway Commission, having awarded contract to the William N. Flynt Granite Co., of Palmer, for \$15,533. Although bids were asked for two styles of construction, this company was the only one that submitted a price for which it would build stone arch style of bridge.

Boston, Mass.—Norfolk County Commissioners have opened bids for construction of new concrete bridge over the Charles River at Dedham ave. at the boundary between Dedham and Needham. Bidders were: Ferdinand A. Wyman, Jr., Boston; T. Stuart & Sons Co., Newton; Holbrook, Cabot & Rollins, Boston; Fred Ley & Co., Springfield; John Cashman & Sons Co., West Quincy; Coughlan & Shiels, Boston; Wellington & McCarthy, Boston, and Coleman Bros., Boston.

Dedham, Mass.—Norfolk County Commissioners have awarded contract for constructing a new bridge over the Charles River between Dedham and Needham, to John Cashman, of Quincy, whose bid was \$17,060.50. The largest bid was \$24,000, by Coleman Bros.

Northampton, Mass.—Contract for replanking Connecticut River bridge has been let to Myron C. Bailey for \$3,000; only other bidder was D. A. Sullivan.

Taunton, Mass.—Contract for constructing the bridge over Mill River, at W. Adams St., has been awarded to W. S. Aerle & Son, of East Boston, at \$7,400. E. I. Crossman, Mayor.

Kansas City, Mo.—The A. M. Blodgett Constr. Co., Commerce Bldg., has secured contract for constructing the Lydia Ave. viaduct for about \$60,000.

Bloomfield, N. J.—Board of County Freeholders, Newark, has awarded contract for constructing bridge at West St. to the Goeller Iron Works and A. E. Sanford, at \$4,340.

Tulsa, Okla.—The County Commissioners have awarded contracts for constructing bridges as follows: To the Canton Bridge Co., of Canton, O., for \$54,990, two bridges to be built over Pole Cat Creek, in the southern part of the county, one across the Arkansas River at Jenks, and the fourth bridge is on the Creek Co. line. Other bidders were the Illinois Steel Co., \$58,330; Wichita Constr. Co., \$61,700, and Central States Bridge Co., of Indianapolis, Ind., \$64,600.

Butler, Pa.—Penn Bridge Co., Pittsburg, has secured contract for steel work for proposed Cobbett bridge at \$369; T. F. Heron, Washington Township, will do stone work at \$6 per cu. yd.

Contract for new bridge near Isle has been awarded to J. I. Campbell and A. T. Beatty, city, at \$1,549.

Pittsburg, Pa.—County Commissioners have awarded contract for filling approach to bridge No. 1, over Allegheny River, to James H. McQuade Co., Conestoga Bldg., city, at \$8,754.

Reading, Pa.—Contract for erecting bridge over Maiden Creek, at Virginsville,

has been awarded to Nelson-Merydith Co., Chambersburg, for \$8,125.

Knoxville, Tenn.—Board of Public Works has awarded contract to Claude A. Hood to build the abutments for the Glenwood ave. bridge. Only one bid was submitted on furnishing rock to the city, which was rejected.

Maryville, Tenn.—Arthur T. Wardrep, Knoxville, has secured contract to construct five reinforced-concrete bridges in Blount County.

Memphis, Tenn.—Park Commissioners have awarded contract to J. A. Omberg, Jr., Memphis, for constructing proposed 19 bridges and culverts in Riverside Park; mostly reinforced concrete work; cost \$20,000.

Shanklin, Va.—Bids have been opened by State Highway Commissioner for constructing steel bridge, 140-ft. span, 70-ft. approach, over Jackson River. Contract awarded to York Bridge Co., of York, Pa., for \$2,775.

Edmonton, Alta., Can.—Charles May, city, has been awarded contract for construction of the Grand Trunk Pacific Ry. bridge over the McLeod River; entire structure will cost about \$275,000.

Winnipeg, Man., Can.—S. C. Hill & Co., city, have received contract for building all bridges along Calgary-Tofield branch of Grand Trunk Pacific Railway. Contract includes a 3,000-ft. and also an 800-ft. bridge.

MISCELLANEOUS

Birmingham, Ala.—Senate has passed bill allowing Mayor to sell blind end of streets, using proceeds for establishment and maintenance of parks.

Gadsden, Ala.—Etowah Commissioners have called election for September 27 on \$20,000 jail bonds.

Guntersville, Ala.—Marshall County will erect a \$25,000 jail.

Oakland, Cal.—Western Water Front League is urging a \$100,000 bond issue for docks and wharves on western water front.

Lake Forest, Ill.—Mrs. Harold F. McCormick has engaged Architect D. H. Burnham, Chicago, to design plan for creating a series of islands some distance out in the lake, sheltered harbor for boats and yachts within the bulwark and on the shore municipal bathing house, beach and piers; preliminary work will cost \$200,000.—Mayor F. H. Gade is interested.

Evansville, Ind.—City is considering enlargement and improvement of Cook's Park.

Baltimore, Md.—Plans are being prepared by Harbor Engineer Oscar F. Lackey for municipal recreation pier.

Lynn, Mass.—Council has appropriated \$6,000 for remodeling City Hall.

North Attleboro, Mass.—City has sold \$38,500 municipal bonds to R. L. Day & Co. at \$102.099.

Springfield, Mass.—New plans for proposed wharf to be built by Springfield Gas Light and United Electric Light companies at river front have been submitted to Harbor Master Charles T. Shean.

Springfield, Mass.—Police Commissioners have recommended erection of building at Court and Water sts.; cost \$130,000.—Kirkham & Parlett, Architects.

Taunton, Mass.—Committee on new police station has rejected plans heretofore under discussion and will have plans prepared for four-wall building.

Coleraine, Minn.—Citizens have voted \$40,000 bonds for village hall.

St. Paul, Minn.—An official party of 25 have left for Montreal to gain ideas for future park and parkway extensions and other improvements; number of clubs in East will also be visited.

Kansas City, Mo.—S. Walters Fox has estimated cost of dyking Missouri River from Broadway to mouth of Blue River, to protect levee and east bottom lands from floods, at \$1,781,222.

Hoboken, N. J.—Mayor G. H. Steil is urging erection of new Police headquarters.

South Amboy, N. J.—Mayor Scully has recommended repair and maintenance of city dock.

Trenton, N. J.—Officials of Pennsylvania Railroad have notified County Engineer Frank J. Eppele that they have approved plans for new park tunnel without change.

Albany, N. Y.—State Engineers will place 1,500 stone markers at county and town lines and crossroads on boundary line between States of New York and Connecticut.—H. W. DeGraff, Deputy State Engineer.

Cincinnati, O.—Council is considering \$25,000 bond issue for improving and completing improvements of existing parks.

Cincinnati, O.—Site will soon be selected for proposed bath house and gymnasium.

Cleveland, O.—Board of Control has rejected all bids for improving entrance to Washington Park; \$4,000 is available.

Ardmore, Okla.—Carter County has voted \$385,000 Court House, bridge and road bonds.

Oklahoma City, Okla.—Council will consider a resolution calling for \$45,000 bonds for city incinerator.

Taloga, Okla.—Citizens have voted bonds for erection of a City Hall.

Lead, S. D.—Council has appointed committee to select site and secure plans for City Hall.—A. E. Anderson, Chairman of Committee.

Knoxville, Tenn.—Council is considering ordinance appropriating \$250 to purchase motorcycle for police department.

Galveston, Tex.—City Engineer A. T. Dickey has estimated cost of constructing rock jetties to protect beach in front of rip rap at \$3,020.

Sulphur Springs, Tex.—City has accepted plans for proposed Carnegie library.—R. B. Keasler, Mayor.

Seattle, Wash.—Council has authorized Chief of Police to buy a Studebaker touring car.

Seattle, Wash.—After approving preliminary plans and sketches for large animal house at the Woodland Park Zoo, Board of Park Commissioners has authorized Secretary Roland W. Cotterill to advertise for bids on a structure to cost \$12,000.

Morgantown, W. Va.—City is to have a new city building to be used by city officials and fire and police departments.

BIDS RECEIVED AND CONTRACTS AWARDED

Guntersville, Ala.—Contract for building new jail at this place has been awarded Southern Steel Structural Co. of San An-

tonio, Tex., represented by C. G. Youngblood.

Arbuckle, Cal.—Most of the levee work for which bids were opened August 19, was awarded to Langenour & Kalsbeek at 16c. per cu. yd. Wilbur Peart was given piping and timber work of the big Browning break; concrete work on the Coughlan break was awarded to W. C. Blean, of Colusa, at \$70 per cu. yd.; work filling in of Browning break was given to Dan Anger, of Grimes, at 21c. per cu. yd.; job will take 60,000 yards.

Oakland, Cal.—Bids for street sweeping have been opened by Board of Public Works. There were but two offers to do the street cleaning made. Joseph Martin submitted a bid of \$8.50 and the Sanitary Street Sweeping Co. a bid of \$12 a lin. mile.

Pasadena, Cal.—Council has purchased two automobiles of the Hanson & Whitman Co., of Pasadena, at \$600 and \$500 respectively.

Fort Wayne, Ind.—County Commissioners received two bids for an automobile for their own use. The bidders were the Randall Motor Car Co. and A. J. Roussey. Both bids were for \$1,700.

Sioux City, Ia.—Final award of contract for building eight-cell addition to Woodbury County jail has been made to Stewart Ironwork Company, Cincinnati, O., by Jail Committee; price named in bid by Stewart Company was \$2,700.

Elmira, N. Y.—Eastern Manufacturing Company, city, has been awarded the contract to furnish 30,000 feet of wood pipe to be used to convey the water supply of the Lackawanna Railroad in Scranton and vicinity.

Fulton, N. Y.—Sub-contract for raising lower dam has been let to Walter Bradley Contracting Co. by the Barge Canal Contractors and preparations are now being made by the Bradley company to carry on the work.

Syracuse, N. Y.—N. D. Pound, Chicago, Ill., will be awarded contract for improving Onondaga Creek on his bid of \$226,491.60, received with five other bids by the Intercepting Sewer Board.

Dayton, O.—Service Board has decided to change contract awarded to Schaeffer & Dill for repair of the Wolf Creek levee from concrete to stone; contract involves a sum of considerably more than \$1,000; contractors were low bidders on both stone and cement, and the change will involve no additional expense to the city.

Eaton, O.—Council has received a bid from F. M. Brower to furnish 300 bbls. of cement for \$1.14.

Houston, Tex.—City has awarded contract for dredging city slips at Brewing Basin to John Jacobson, of the Atlantic, Pacific & Gulf Dredging Company, on straight bid of 32 cents per cu. yd. for all earth excavated; cost about \$124,800.

Wheeling, W. Va.—Board of Control has taken up matter of adding considerable new apparatus for keeping streets and for water works; following equipment were considered: A street sweeper, street roller, street sprinkler, stone crusher and a greenhouse; purchase of machines named was taken up with representatives of the Kelly Springfield Road Roller Co., of Springfield, O., and of the Good Roads' Machine Co., of Pittsburg, and bids were submitted by the competing firms but no definite action taken.

TOO LATE FOR CLASSIFICATION

STREET IMPROVEMENTS

Northport, Ala.—Bids will be received September 6, noon, for construction of about 3,000 sq. yds. of sidewalks and 1,200 lin. ft. of concrete curb and gutter.—Dr. A. A. Kirk, Mayor.

Hartford, Conn.—Bids will be received September 2, 2 p. m., for construction of gravel roads in towns of East Granby and Stafford.—J. H. MacDonald, State Highway Commissioner.

Aurora, Ill.—Board of Local Improvements has ordered brick paving for three streets.

Evansville, Ind.—Cost of bricking Fourth st., between Locust and Chestnut sts., will be \$6,789.62.

Vanderburgh, Ind.—Bids will be received September 9, 10 a. m., for furnishing steam road roller.—Harry Stinson, Clerk, Board Free Turnpike Directors.

Baltimore, Md.—State Roads Commission will soon advertise for bids for improving Falls road within city limits and the Harford road; Commission is ready to advertise for bids on Westport road and for one mile of road in Carroll county between Westminster and Cranberry Station.

Flint, Mich.—Bids will be received Sept. 7 for constructing cement curb; distance

seven blocks.—D. E. Newcombe, City Clerk.

Buffalo, Minn.—Bids will be received Sept. 6 for grading Grant Ave.—H. C. West, Village Recorder.

Perth Amboy, N. J.—Bids will be received September 7, 8:30 p. m., for construction of asphalt block pavement on Smith st.—G. M. Adam, Street Commissioner.

South Orange, N. J.—Bids will be received Sept. 20, 8 P.M., for laying about 1,112 lin. ft. of 4-ft. cement sidewalk on Turrell ave.—John D. McDonough, Chairman Committee on Streets and Highways.

Dansville, N. Y.—Village Trustees have decided to build macadam road from Main and Perine sts. to foot of Maple st.

Minot, N. D.—Bids will be received by Board of Commissioners of Ward County Sept. 13, 2 P.M., for constructing various grades.—Louis A. Larson, County Auditor.

Cambridge, O.—Bids will be received by Commissioners of Guernsey County Sept. 7, noon, for grading, macadamizing and paving one mile of road in Cambridge Township; cost \$7,772.45; 0.76 miles of road in Jackson Township, \$4,373.52, and one mile of road in Millwood Township, \$8,229.12.—Jas. C. Wonders, State Highway Commissioner.

Lancaster, O.—Bids will be received Sept. 4, noon, for constructing a ce-

ment sidewalk at Broad and Main sts.—George Cunningham, Clerk Board of Public Service.

Mt. Gilead, O.—Bids will be received Sept. 18, 11 A.M., for the construction of the Bloomfield and Westfield roads.—W. C. McFarland, Morrow County Auditor.

Pomeroy, O.—Bids will be received Sept. 14, noon, for grading and paving with brick 0.34 miles of road in Rutland Township and 0.398 miles in Salisbury Township; cost \$3,102 and \$3,619.56, respectively.—Jas. C. Wonders, State Highway Commissioner.

Toledo, O.—Bids will be received Sept. 14, 10 A.M., for grading, draining and macadamizing the Corduroy road.—D. T. Davies Lucas County Auditor.

Somers, Pa.—Bids will be received by State Highway Department, Harrisburg, until Sept. 8, for 5,900 ft. of road in Somerset County.—Jos. W. Hunter, Commissioner.

Uniontown, Pa.—Bids will be received by State Highway Department, Harrisburg, until Sept. 8, for the construction of two roads in Fayette County.—Jos. W. Hunter, Commissioner.

Washington, Pa.—Bids will be received by State Highway Department, Harrisburg, until Sept. 9, for constructing two roads in Washington County.—Jos. W. Hunter, Commissioner.

BIDS RECEIVED

Wilmington, Del.—The following bids were received for building county roads: Hillside Mills road, from Campbell's cross roads on the Kennett turnpike to Hillside Mills and thence to Mt. Cuba bridge and thence to Ashland bridge, a distance of about three and one-half miles.

B. L. Wickersham, of Kennett Square, granite or trap rock bottom and surface, \$28,330; limestone, \$31,955; Warrenite, \$41,594.70.

William C. Evans, Ambler, Pa., granite or trap rock, \$30,484.90; limestone, \$38,738.02; Amisite, \$42,090.85; tar binder, \$38,222.20.

Corcoran Construction Company, granite or trap rock, \$24,003.58; limestone, \$26,072.16; Amisite, \$32,257; asphaltum binder, \$28,388.35; tar binder, \$28,388.35.

Milltown road, in Mill Creek hundred, a distance of less than half a mile:

Joseph F. Bradley, \$2,729.33.

Stewart & Donohue, \$2,900.

William C. Evans, \$2,845.

Creek road, in Mill Creek hundred, from Red Clay Creek Church to Hockessin, a distance of about four miles.

William C. Evans, stone macadam surface, \$39,005.50; Amisite, \$47,849.50; asphaltum binder, \$43,427.50; tar binder, \$41,953.50.

Corcoran Construction Company, stone macadam, \$32,866; Amisite, \$44,658; asphaltum binder, \$37,877; tar, \$37,877.

B. L. Wickersham, stone, \$32,250 and \$36,100; Amisite, \$44,220; Warrenite, \$52,294.

Joseph L. Bradley, stone, \$24,988.20; Amisite, \$29,480.

Chicago, Ill.—Alex N. Todd, bidding for the Iroquois Paving Co., was the low bidder for the asphalt repairing contract, at 72½¢ per sq. yd. The Foulkes-Forbes Co. bid 76¢ per sq. yd.

Utica, N. Y.—The Barber Asphalt Paving Company has been awarded the contract for paving with asphalt about 6½ miles of road, from Waterford to the Saratoga County line.

Pittsburg, Pa.—The following low bids for road work have been received by the County Commissioners: Lock No. 3 and Elkhorn road, A. G. Rathey & Co., \$54,882.17; McLaughlin Contracting Company, \$5,696.80; Joseph Nixon, \$57,523.88. Greensburg Pike No. 2, Joseph Napolitano, \$46,959.17; Collins-Gordon Contracting Company, \$52,236.81; R. H. Cunningham & Co., \$53,983.63.

Warren, Pa.—W. R. Lavery has been awarded a contract for paving 4th st. with Corry blocks for \$10,313. Details of the various bids were as follows: W. R. Lavery & Son bid a total of \$10,313 for the paving and curbing complete by using Corry block; \$13,805.20 for the pavement complete by using asphalt block; \$10,496.80 for the paving complete by using Kushequa block and \$10,818.45 for the paving complete by using Jamestown block.

Charles A. Ott bid as follows: A total of \$10,251.55 for the paving complete, using Jamestown block; \$1,019.45 for the paving complete, using asphalt block; \$10,343.45 for the paving complete, using Corry block; \$10,711.05 for the paving complete, using Kushequa block.

L. A. Coates bid \$9,932.26 for the paving complete, using Jamestown block; \$13,838.01 for the paving complete, using asphalt block; \$10,024.16 for the paving complete, using Corry block; \$10,070.11 for the paving complete, using Kushequa block.

SEWERAGE

Washington, D. C.—Acting Engineer Commissioner Markham has recommended that a number of service sewers be constructed in different sections of district.

Tolleston, Ind.—Messrs. Alvord and Burdick, Engineers, Hartford Bldg., Chicago, Ill., are conducting investigations and will soon make report on new sewerage system, with disposal plant.

Clarinda, Ia.—Bids will be received Sept. 14, 8 P.M., for constructing sanitary sewers.—C. W. Stuart, City Clerk.

Topeka, Kan.—East Side Improvement Association is urging creation of drainage district.—Frank Curry, Chairman Committee.

Boston, Mass.—Bids will be received September 7, noon, for sewerage work in four streets, Dorchester.—G. C. Emerson, Superintendent of Streets.

Pittsfield, Mass.—Bids will be asked for a trunk sewer to be laid in Tacome.

Battle Creek, Mich.—Bids will be received by Post Land Co. for constructing 2,700 ft. of 8 to 15-in. tile sewer, with manholes; materials will be furnished.—H. K. Whitney, City Engineer.

Marshall, Minn.—Bids will be received Sept. 6, 8 P.M., for constructing ten catch basins.—C. P. Shepard, City Recorder.

Rome, N. Y.—Mayor A. R. Kessinger and a number of city officials are inspecting

sewage disposal plants in various cities, as city will construct plant in near future.

Alliance, O.—Bids will be received Sept. 3, noon, for the construction of sanitary sewer No. 111.—C. E. Swearington, Clerk, Board of Public Service.

Dunmore, Pa.—Bids will be received Sept. 7, 8 P.M., for constructing sewers in sec. "A" of the Third sewer district.—C. H. Genter, Secretary Council.

South Media, Pa.—Nether Providence Township is urging construction of drainage system on highways.

Dallas, Tex.—City Commission has adopted resolution by which city will superintend laying one and a half miles of 8-in. sewer in Interstate Suburban Realty Co.'s property, Oak Cliff.

Kenosha, Wis.—Messrs. Alvord and Burdick, Engineers, Hartford Bldg., Chicago, Ill., are conducting investigations and will soon make report on a trunk sewer.

Collingswood, Ont., Can.—Town Engineer K. S. Macdonnell will receive tenders for the construction of sewer extensions.

BIDS RECEIVED

Oswego, N. Y.—Commissioner of Works Smith opened bids August 27 for constructing a sewer in West 3d st. as follows: James Fennell, \$2,420.42; Barnett Contracting Co., \$2,694.81.

Fargo, N. D.—L. W. Schruth has been awarded the contract for constructing a sewer on 13th st. at 98c. lin. ft., \$50 for manholes, \$57 for catch basins and \$1.38 for flush tanks. C. H. Porritt has been awarded the contract for constructing a sewer on 10th st. at \$1.43 per lin. ft. for the sewer, \$56 for manholes, \$59 for catch basins; also sewer on 4th st., \$1.75 per lin. ft., \$68 for manholes, and \$59 for catch basins.

WATER SUPPLY

San Francisco, Cal.—P. H. Shaughnessy, Chief of Fire Department, is in New York City to get ideas of high-pressure fire system.

New Britain, Conn.—Council has authorized issuance of \$250,000 water bonds.

Washington, D. C.—Major J. J. Morrow, Engineer in Charge District Water Supply System, has recommended completion within three years of installation of meters in private services and within one year of meters for government service.

Chicago Heights, Ill.—Messrs. Alvord and Burdick, Engineers, Hartford Bldg., Chicago, are making investigations and will soon report on extension of water works.

Paris, Ill.—Professor William Plew, Rose Polytechnic, Terre Haute, has recommended the installation of filter at municipal pumping plant to purify the city water supply.

Waukegan, Ill.—Bids will be received Sept. 2, 8 P.M., for constructing a 6-in. water supply pipe, with the necessary valves and valve boxes in County st.; also for constructing 6-in. water supply pipe in Sunderlin st.—Edw. P. De Wolf, Secretary, Board of Local Improvements.

Holland, Mich.—Messrs. Alvord and Burdick, Engineers, Hartford Bldg., Chicago, Ill., are making investigations and will soon report on extension of water works.

Cohoes, N. Y.—Cohoes Savings Institution has purchased \$75,000 water supply improvement bonds.

Cheviot, O.—Bids will be received Sept. 6, noon, for laying 6-in. water pier, setting fire hydrants, valves and special castings in Treway Ave.—Chas. Craig, Village Recorder.

Ironton, O.—Special Water Committee and Service Board will investigate water system.

Newark, O.—Bids will be received Sept. 2, noon, for the construction of an infiltration intake for the municipal water works.—A. C. Gundloch, Clerk, Board Local Improvements.

Bellwood, Pa.—Logan Valley Water Co., which supplies Quality Knob section and other parts of Antis Township with water, has decided to build new and much larger reservoir on present site of company's dam.

BIDS RECEIVED

Fargo, N. D.—C. H. Porritt has been awarded the contract for laying water main on 14th st. at \$1.34 per lin. ft., and \$61 for hydrants. Other bidders were C. W. Haggard, \$1.38 per lin. ft. and \$63 for hydrants; L. W. Schruth, \$1.35 per lin. ft. and \$62.50 for hydrants. Porritt has also been awarded contracts for water mains on other streets.

Norfolk, Va.—H. Mueller Mfg. Co. has been awarded a contract for furnishing corporation cocks. Contracts for water department supplies, including valves, hydrants, pipe, etc., were awarded to M. J. Drummond & Co. and to W. P. Oberndorfer & Co.

LIGHTING AND POWER

Melrose, Cal.—City has formed an electric light district in conformity with new State law.

St. Maries, Ida.—Council has granted G. H. Jay an electric lighting franchise.

Worcester, Mass.—Connecticut River Power Co. has petitioned Gas and Electric Light Commission for authority to supply electricity for lighting and power, having already secured franchises in some towns to west of the city.

St. John, N. B., Can.—Shediac Light & Power Co. will soon open tenders for dam to be constructed across the Scoudac River; company has been formed with franchise to supply electric light and power to town.

FIRE EQUIPMENT

Fort Smith, Ark.—City will purchase 2,500 ft. of hose.

Fresno, Cal.—Bids will be received Sept. 8 for building addition to engine house.—W. O. Miles, City Clerk.

Mill Valley, Cal.—City has passed ordinance for purchase of fire-fighting equipment.

Vallejo, Cal.—City will build and equip fire station; department will be reorganized.

Chicago Heights, Ill.—Bids will be received by Council Sept. 7, 8 P.M., for the erection of a two-story building on West End ave.—J. C. Mote, Mayor.

West Centralville, Mass.—Residents are urging immediate equipment of fire house in that section.

Columbia, Mo.—City is considering purchase of an engine.

Brooklyn, N. Y.—Bids will be received by Fire Department Sept. 7 for repairing quarters of Engine Co. No. 140, on Prospect ave.—Nicholas J. Hayes, Commissioner.

Perth Amboy, N. J.—City is considering purchase of a steamer, hose wagon and 2,000 ft. of hose.

BRIDGES

Phoenix, Ariz.—Puma Indians will contribute \$5,000 toward erection of \$50,000 public bridge over Gila River.—Dwight Hurd is interested.

Goshen, Ind.—Bids will be received Sept. 6 for construction of a 75-ft. steel bridge, with concrete abutments, in York Township; also for the construction of Union bridge, 65 ft. long; also for the Elkhart bridges, 65 ft. long, steel, with concrete abutments.—W. H. Rood and Elias Fisher, County Commissioners.

Topeka, Kan.—Citizens have voted to erect extension on Melan st. bridge at cost of \$20,000; also bridge over Shunganunga st. at \$4,101.

Faribault, Minn.—Bids will be received Sept. 6, 8 P.M., for the construction of a deck girder bridge on 14th st., over the Straight River.—D. F. Mackenzie, City Recorder.

South Amboy, N. J.—Plans and specifications for the new trolley bridge to parallel county bridge between Perth Amboy and South Amboy are completed and ready for inspection; plans are on file in office of Jersey Central Traction Co. at Keyport.

Minot, N. Dak.—Bids will be received by Board of Commissioners of Ward County, Sept. 13, 2 P.M., for constructing bridges.—Louis A. Larson, County Auditor.

Coshocton, O.—Fifty-eight bridges have been destroyed by cloudburst and flood in Licking County; to replace them bond issue will be necessary.

Sandusky, O.—Bids will be received by Board of Commissioners of Erie County, Sept. 10, for the construction of four concrete arches, 5, 7, 8 and 17 ft., respectively.—R. D. Smith, County Surveyor.

Kittanning, Pa.—J. W. Aris, Pittsburg, representing the War Department, has submitted to local authorities plans for raising the Kittanning Bridge over the Allegheny River 19 feet; this would place the bridge 50 feet above the pool level and raise grade of the approaches.

MISCELLANEOUS

Chicago, Ill.—City has 17,084 street intersections, each of which, according to figures announced by William Carroll, City Electrician, should have street name signs on two corners; expense of putting in place cheapest sign would amount to \$5, which at the rate of two for each corner would cost the city a total of \$170,840.

Chicago, Ill.—South Side Business Men's Association is urging the installation of a \$50,000 municipal ice plant.

Baltimore, Md.—Board of Trade is urging construction of channel 35 ft. deep and 600 ft. wide from city to sea.—C. C. MacGill, President.

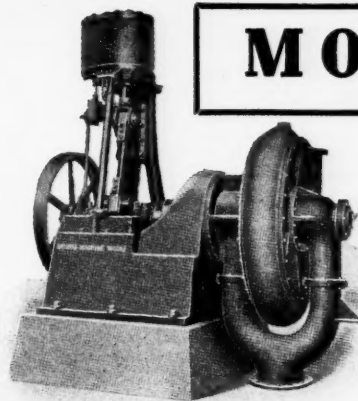
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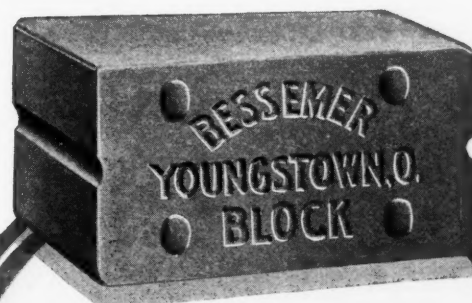
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TRADE NOTES

Cast-Iron Pipe.—Routine orders ranging from one to ten cars have been very satisfactory. Prices unchanged. Quotations: 4-inch, \$27.50; 6 to 12-inch, \$26.50; 16-inch and up, \$25.50. Birmingham: Demand is light and prices unchanged. The gradual increase in the cost of raw material, it is conceded, must result in higher prices. Stocks on hand are not large. Quotations: 4 to 6-inch, \$26; 8 to 12-inch, \$25; over 12-inch, average \$24.

Lead.—Firm prices have been established for lead, and although the demand is light sellers are offering no inducements in the way of shading. All of the lead offered at resale has been taken from the market, and the American Smelting and Refining Company is asking 4.40c., New York, while outside interests are demanding 4.42½c.

Water Company Improves Management.—Conditions regarding the water supply have greatly improved since the changes in management of the Merchantville, N. J., Water Company. There has been an improvement in the pressure, the water in both stand pipes showing a height of from 90 to 100 feet. The increased pressure has stirred up the rust in mains so that the water is slightly discolored, but the officials are blowing out the plugs, and that difficulty will soon be over. The new aerating tower has been connected and is in operation.

Purinton Paving Brick.—According to figures of the U. S. Geological Survey, the Purinton Paving Brick Company, Galesburg, Ill., furnished nearly one-tenth of the total paving brick output of the country. The output of the Galesburg company, last year, was 105,231,000 brick. These were the 7-pound paving brick that are generally used. If this entire output had been figured in the survey report as paving brick it would be better than 10 per cent. of the whole, but the seconds are sold for building purposes, and are figured in the Government reports as building or common brick. The percentage of the total output sold for paving brick is 85 per cent., and that means that nearly one-tenth of the entire output of 978,122,000 was produced here. The value of the entire product of paving brick in the U. S. was \$10,657,475.

Edison Rock Crusher.—Thomas A. Edison has perfected a machine that will reduce a boulder weighing from 12 to 14 tons and measuring seven or eight feet in width into a pile of six-inch rocks suitable for smaller rollers to crush into road-making material for other uses. He has spent most of the time of his visits to the cement works, New Village, N. J., in experimenting and building the machine, which weighs nearly 40 tons. It is now in operation. Inside of the machine are two large rolls, seven feet wide and six feet in diameter, which are enclosed in a gigantic hopper. These rolls have octagonal faced mandrels, or plate beds, on which the molars or grinders are fastened with bolts that weigh from 10 to 30 pounds each. These rollers are attached to a pulley which is connected with a belt to a large motor with great horsepower. Great speed is generated, and the railroad freight car is backed up to the hopper, on which are usually two 14-ton boulders. A magnetic lifting contrivance is lowered over them, a clutch grips the heavy rock and then a button is pressed and a lever pulled.

The stone is dropped by the shutting off of the magnetic currents and falls into the hopper. There is a terrific roar and the boulder is crushed. It is said that the new process will cheapen the cost of cement materially.

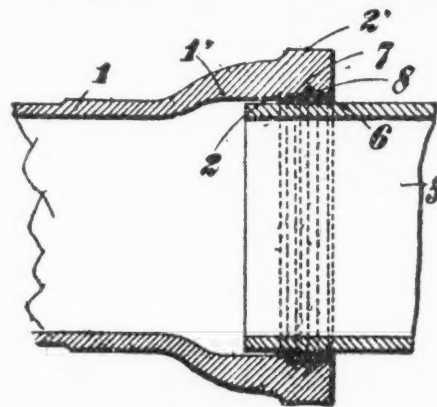
Voting Machine.—A. Y. Gillespie, Atlantic, Ia., has invented a voting machine which he believes is superior to all others. It can be used in a primary, where each voter must vote his own party ticket, or in a general election, where mixed tickets are voted. The machine is two feet square, four inches deep, and weighs 250 pounds. The machine proper is really nothing more than a counting machine, as it is not used at all by the voter until after he has indicated his choice of candidates. The voter indicates his choice of candidates by means of mechanical ballots. Each voter may take a mechanical ballot into the booth with him and vote at his leisure without feeling that he is in the way of another voter who wishes to use the ballot. The only place where one voter might be in the way of another would be in registering his ballot on the machine after he has voted. There would not need to be much of a rush in this, Mr. Gillespie says, as three voters may easily register their ballots in one minute. The mechanical ballot is simply a tin plate about twenty inches square, containing the names of candidates in columns. At the left of the group of candidates for each office is an indicator, which moves in a groove. The voter moves an indicator down the groove to a point opposite the name of each man for whom he votes. Then he turns the ballot upside down so that no one can see how he has voted and comes out of the booth and goes to the machine. With the aid of the inspector he places his mechanical ballot upside down in the counting machine, the inspector closes the door, or lid to the counting machine, and the voter turns a crank, which he finds right at his hand as he stands in front of the machine. The machine is so arranged that when the mechanical ballot is placed in it there is an iron bar at the left of each column of candidates. When the voter turns the crank all of these iron bars move to the right and take all obstacles in their way with them. The only obstacles are the indicators on the mechanical ballots. As each indicator is struck by the bar it moves over and in the bottom of the machine one vote is registered for each candidate whose name is opposite an indicator. The registering on the bottom of the machine is by means of metallic figures, and after the polls have closed it is only necessary to swing the machine around, so it is upside down and take off the vote which has been cast for each candidate.

High-Pressure Fire Service.—High-pressure 12-inch salt water mains, which will give the eastern water front of Portsmouth, Va., as fine a system of protection against fire as is possessed by any seaport city of its size in the country, are being installed by the Seaboard Air Line Railway. In connection with the installation of these mains, a powerful pump to operate this fire service is being placed in the power plant of the Seaboard, in North street, which will have sufficient capacity to force salt water through the mains at a pressure that will eliminate the necessity of fire engines, in the event of a blaze, in or nearby the mammoth warehouses and docks of the Seaboard fronting on Water street.

PATENT CLAIMS

928,896. PIPE-JOINT. Léon Billé, Paris, France, assignor of one-half to Societe Metallurgique du Perigord, Paris, France, a Corporation of France. Serial No. 381,371.

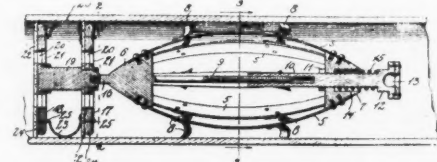
A pipe joint comprising cooperating sections, one of the latter having an inner circumferential groove, a packing ring composed of relatively soft material interposed between the sections, and a locking ring interposed between the said sections



behind said packing ring, the locking ring pressing against the packing ring with a pressure substantially equal to the limit of compressibility of the packing ring, the material of the locking ring being expanded laterally into said groove to lock the packing ring in compressed condition.

928,863. CLEANER FOR MAINS AND PIPES. Hugh A. Greenan and Frank O. Redford, Louisville, Ky., assignors to American Water Main Cleaning and Contracting Co., Louisville, Ky. Serial No. 468,274.

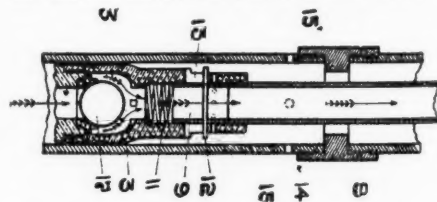
In a cleaner for mains and pipes, a scraping member; a pair of pistons connected thereto for propelling the same, said



pistons being located in close proximity to each other; and outwardly bowed springs fastened at one end to one of the pistons, and having their free ends in engagement with the other piston.

928,639. DEEP-WELL PUMP. Byron De-woody, Franklin, Pa. Serial No. 427,918.

In a deep-well pump, a working barrel located in proximity to the bottom of the well, means for anchoring said barrel, a standing valve located in said barrel at the bottom thereof, a piston in said barrel



adapted to the upward passage of oil there-through, means in said piston preventing the regurgitation of said oil, a tubular rod attached to said piston adapted to the purpose of operating the same and also as means for conducting oil from said working barrel to the surface of the ground, and a drain-valve positioned above said piston and adapted to automatically drain said tubular rod when the same is being withdrawn from the well.

929,694. METHOD AND APPARATUS FOR MAKING CULVERTS OF CONCRETE. Henry Noah, Baxter, Ia. Serial No. 459,943.

In an apparatus for making culverts and the like from concrete complete in one length, two plates rigidly connected at their lower portions to be retained at some distance apart, a rotatable shaft mounted in bearings at the centers of said plates, up-rights slidably connected with said plates, segments adjustably connected with the